May-June 2011

A Joint Publication for U.S. Artillery Professionals

Fires

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Fires capability

for wide area security & combined arms maneuver

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2LT Eric Null, Field Artillery School student and youngest field artillery officer in the Army, unveils the 100th Anniversary monument at the 100th Anniversary of the Field Artillery School of Fire celebration in front of the original School of Fire, which dates back to 1911. (Photo by Keith Pannell, U.S. Army)

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PURPOSE: Founded in 2007, *Fires* serves as a forum for the professional discussions of all Fires professionals, both active and Reserve Component (RC); disseminates professional knowledge about progress, developments and best use in campaigns; cultivates a common understanding of the power, limitations and application of joint Fires, both lethal and nonlethal; fosters joint Fires interdependency among the armed services; and promotes the understanding of and interoperability between the branches, both active and RC, all of which contribute to the good of Army, joint and combined forces, and our nation.
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On the cover: SPC Nicholas Francioso, armored crewman, assigned to 2nd Squad, 3rd Platoon, Charlie Company, 1st Battalion, 66th Armored Regiment, 1st Brigade Combat Team, 4th Infantry Division, kneels atop a cliff overlooking the Arghandab River Valley 31. (Photo by SPC Breanne Pye, U.S. Army)

per fire support element (FSE), Fires and effects cell (FEC), effects coordination cell (ECC) fire support cell (FSC), and separate battery or detachment; 2 per fire support team (FIST); and 1 per Master Gunner. Free copies to Army ADA units: 7 per air and missile defense command (AAMDC) and ADA brigade headquarters; 13 per ADA battalion; and 3 per air defense airspace management cell (ADAM) and separate battery or detachment. The FA and ADA Schools' departments, directorates and divisions each get 2 copies. Other Army branch and US armed services units/organizations and US government agencies that work with FA or ADA personnel, equipment, doctrine, tactics, training organization or leadership issues may request a free copy—including, but not limited to—ROTCs, recruiting commands, libraries, attaches, liaison officers, state adjutants general, public affairs offices, military academies, laboratories, arsenals, major commands, etc. Contact *Fires* at http://sill-www.army.mil/firesbulletin/.

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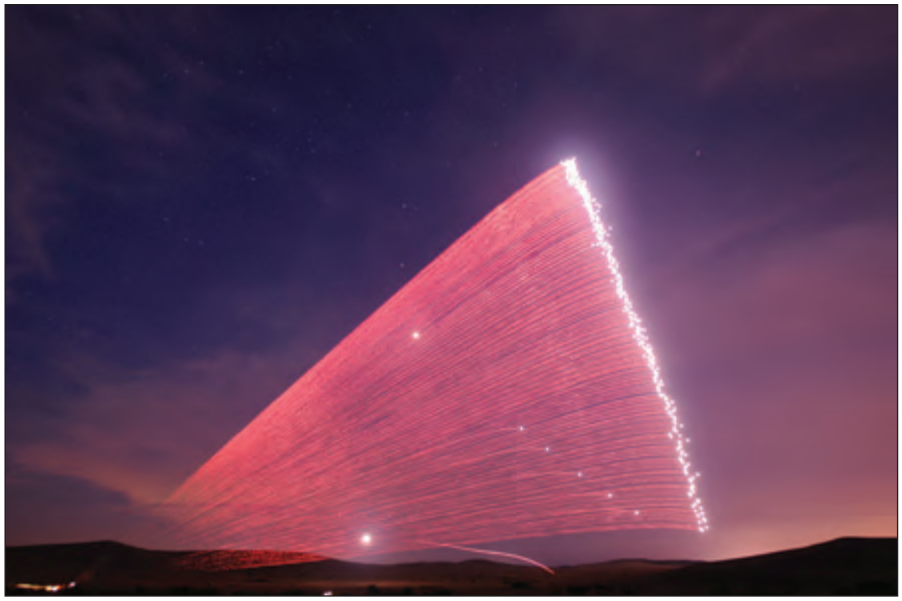
A Soldier from Battery L, 2nd Squadron, 3rd Armored Cavalry Regiment, leads Iraqi army soldiers in a squad drill. Soldiers from 3rd Armored Cavalry Regiment, who were deployed with the 1st Battalion, 10th Field Artillery last year, worked with local IA on basic squad and platoon level exercises to improve their cohesion and readiness. (Photo by SSG Garrett Ralston, U.S. Army)

$300 First Prize
Fires Bulletin Photo Contest 2011

This annual contest obtains high-quality photos that tell the story of today's U.S. artillery professionals conducting training or engaged in full-spectrum operations. These photos may appear as a cover or other shots for future editions of the magazine, as part of the Fires Center of Excellence poster series or in other esprit de corps or strategic communications projects. The competition is open to any military or civilian, amateur or professional photographer.



2010 First Place Winner - Training. (Photo by CW4 Willis Taylor.)

Photo Categories:

There will be two main divisions in the 2011 contest:
1. Professional
2. Amateur

Each division will have subcategories:
1. Training for combat/stability operations
2. Actual combat/stability operations

Prize Winners:

1st place prize winners will receive ***$300*** and 2nd place prize winners will receive ***$100***. Enter as many photos as you wish, but winners will be limited to one per category.

Contest Rules:

* Only photos taken in the last 36 months are eligible.
* Entries must be received by the magazine no later than August 31, 2011.
* Each photo must be a jpg or tif image with little or no compression.
* Each photo must be taken with a camera on its highest resolution setting.
* Images cannot be manipulated.
* Photos cannot be copyrighted or owned by an agency/publication.

Judging:

This year judging will take place online. The online voting process will be published soon in future editions of the Fires Bulletin, on the Fires Center of Excellence Facebook, and on the Fires Knowledge Network.

Photo Submissions:

* Each submission must include the photographer's name, unit/affiliation, e-mail address, mailing address and phone number.
* Caption information must include who, from what unit, is doing what, where and when (date) in the photograph - for example: "SGT Joe B. Smith, C/2-20 Fires, 4th Fires Brigade, fires the M777A2 howitzer during unit qualification training at Fort Hood, Texas, Jan. 5, 2011."

Where to submit photos:

Photos can be sent by e-mail or compact disk. CDs will not be returned.
* E-mail image files (one image per e-mail) to Fires Bulletin at paul.e.jiron.civ@mail.mil. Mark the subject line as "2011 Photo Contest/ Entry Category -Your Last Name."
* Mail CDs to ATTN: Photo Contest at P.O. Box 33311; Fort Sill, OK 73503-0311.
* FedEx or UPS submissions to 652 Hamilton Road, Rm 204A, Fort Sill, OK 73503-5600.

All submissions may be used at the discretion of the Fires Bulletin and Fires Center of Excellence STRATCOM staff. Questions? Contact the Fires staff by e-mail at paul.e.jiron.civ@mail.mil or by phone at DSN 639-5121/6806 or 580-442-5121/6806.

2011 State of the Fires

Report from the front

By MG David D. Halverson
Commanding General of the Fires Center of Excellence
and Fort Sill, Okla.

"I have been impressed with the urgency of doing. Knowing is not enough; we must apply. Being willing is not enough; we must do."

–Leonardo da Vinci

Our nation and our Army are in a period of transition which creates a number of issues we must deal with at the Fires Center of Excellence and within the Fires force. We will continue to identify and address these challenges as we move forward, but we must set the foundation for future discussions both here at Fort Sill and within the Army so we can have a voice on how 'Fires' fit into the larger Army and joint picture – that is what this Fires Seminar and our focus at the Fires Center of Excellence is all about.

In this special issue focused on the 2011 Fires Seminar, I talk about the 'State of Fires' and other senior army leaders discuss the concepts leading our Army forward, but I also want to focus on the young leaders who have lived the reality on the ground over the past year.

One such leader is LTC John Delaney who briefed four take-a-ways during the 'Employment of tactical Fires' panel that align with much of this CG forward.

1. The U.S. Army Field Artillery is shooting in Afghanistan – accuracy is a must, and there is a requirement for 24/7, all-weather Fires – we must be responsive and accurate.
2. The five elements of accurate predicted fire is key to mission success and building confidence in our Fires with our joint and combined maneuver commanders.
3. Excalibur requires precision targeting and trained fire supporters to employ.
4. FFA HQs work well in a wide area security environment.

These take-a-ways highlight the reality of today's fight and where we must continue to grow and in some cases, re-vitalize our efforts within the Fires force.

The Fires force. Our number one priority is to give our nation the best Fires force we can, filled with Fires leaders who are capable of understanding situations in depth, who can critically assess those situations, and who can adapt actions to seize and retain the initiative in support of full-spectrum operations. Those leaders must be able to employ both offensive and defensive Fires and understand how to integrate them into the joint and combined battle space. The other reality is that we must train them to accomplish this task while facing significant financial restraint. The Army expects to reduce its ranks by 49,000 over the next several years, and billions of dollars are expected to be cut from the defense budget. For us, this means it won't be **'business as usual.'**

Currently, our Fires force makes up more than seven percent of the Army structure. We are a total team, made up of not only active duty, but U.S. Army Reserve and National Guard warriors alike. The reality is we deliver a lot of capability, both offensive and defensive Fires, at a small cost and support a wide range of contingencies.

Operating environment. We are operating in a new and ever changing environment – both in the combat realm and here in our day-to-day operations.

It's a fact; everyone wants to be partnered with high-end defensive Fires so we continue to be the highest deployed force in the Army. We currently have Soldiers in several different theaters, and it continues to be incumbent upon us, as a Fires force, to shape the enemy's thoughts and environment. We are on track as we continue to refine our way ahead. We recognize our potential adversaries will have access to a wide range of capabilities to counter or interrupt U.S. advantages in communications, surveillance, long-range Fires, armor protection, and mobility.

Through past conflicts we have shown our Fires are all-weather capable and effective

Center of Excellence:

under any operational condition. We will continue to provide versatile Fires capabilities through multiple means to achieve the right effects and minimize unintended consequences. We will use and develop a wide range of conventional to precision capabilities in order to provide effects that include precision (circular error probable [CEP] of less than 10 meters), to near precision (CEP of 10-50 meters) and area capabilities (CEP greater than 50 meters).

Everything we do, we will do in support of the five requirements for accurate and predicted Fires. This is non-negotiable to ensure the long-term health and development of the Fires force as we continually reinforce individual and collective core competencies.

The reality is precision munitions cost money, so as we go forward we have to adjust to what we can afford. Now, more than ever we need to be transparent in how we invest in our Fires capabilities and systems.

The Fires portfolio. We are currently invested in 55 major programs that are projected to cost more than $40+ billion. We will continue to use resource-informed decisions to ensure we spend the nation's resources prudently to meet the current demands of our forces and fiscal restraint our nation needs. We are now validating the majority of our requirements every years via capability portfolio reviews with the Vice Chief of Staff of the Army to ensure our requirements are still valid for the needs of our Soldiers –today and tomorrow. We must do more to deliver incremental capability over time and on schedule. We must fully understand the cost drivers behind our requirements to make the most informed decisions as systems are developed so that we can make prudent trades or deferments as needed. We are working hard with our defense industry partners to ensure they better understand our gaps in capability to help them more wisely invest their research and development dollars.

We are also looking hard at testing for both time required and cost. Testing is critical but we must look for efficiency opportunities and still ensure our requirements are proven and our systems are safe for our Soldiers.

We are similarly reviewing our force structure each year in the total Army analysis process to ensure we can meet the rotational demands of a nation at war and permanently forward deployed forces. Concurrently, we are continually reviewing the assessments of our operational forces to ensure our organizational designs meet their needs. We are currently proposing a number of organizational design changes to make selected unit designs better. The scrutiny we see in looking at requirements as part of system development is clearly as evident for force structure.

Current operational issues. We have a tough road ahead of us as we continue to weigh fiscal restraints with relevant and realistic requirements. The reality is 46 percent of our Air Defense Artillery PATRIOT force is forward deployed. We have to continue to provide critical stability for our Air and Missile Defense mission as well as continue with innovation and development of new systems and strategies.

We must continue to take advantage of improved mission command networks and extended range communications to provide even more versatile Fires for wide area security and combined arms maneuver.

Within the Field Artillery branch, we must continue to address the lack of use and training on digital devices. We must continue to emphasizing the basics of Field Artillery, but embrace technology too, in order to work through and overcome current operational issues.

So along those lines, we have identified it is a must to sustain Joint Fires Observer training. JFO training normally calls for live, surface-to-surface call for fire events; but because live training can be expensive and impractical at times, JFO plans for sustainment here at Fort Sill includes developing trainer support packages, developing an online database for electronic tracking of currencies and working with the U.S. Army Program Executive Office for simulation and training.

We have also identified the need to sustain Field Artillery Fire Finder Radar Operator (13R) training, certification of Fire Supporters/Combat Observation Lasing Team, and training for Fire direction gunnery skills.

These items will stay a priority for the FCoE, in order to produce combat-proficient FA personnel, leaders, crews, and sections.

Common operating picture. We are very engaged across the globe; we are indeed a global Fires force. Both the Field Artillery and Air Defense Artillery are actively engaged not only in Iraq and Afghanistan, but the ADA has a notable presence in Korea throughout the GCC, Japan, Europe, and has sustained operations in the National Capital Region. Field Artillery units are firing more than 6,000 rounds per month in Operation Enduring Freedom joint and combined operations.

Fire support is being used at all levels – from fire support elements to battlefield coordination detachments.

Air Defense Artillery units will continue to be deployed to strategic missions across the globe serving as a strategic deterrent.

As we continue to assess, we found we need to add more maneuver capabilities across our Fires force. This is especially the case with our Counter Rocket, Artillery, and Mortar system. Right now, C-RAM is usually a fixed asset on a forward operating base that is designed to destroy incoming artillery, rockets and mortar rounds in the air before they hit their ground targets. Imagine what it could do if this system were mobile?

We also need more development for our nation's tactical ballistic missile defense, by acquiring more weapons and sensors to develop capabilities against the threat of ballistic missile attack. Concerns about collateral damage and public perceptions have also increase the need for integrating space and cyberspace capabilities into all military operations to enable friendly force tracking, geospatial accuracy, beyond-line-of-sight communications and precision targeting capabilities to improve the overall situational awareness of the maneuver commander.

We have identified the need to capitalize on Unmanned Aircraft Systems capabilities and implement emerging technologies so the warfighter can conduct missions more effectively and with less risk, but on the flip side we must also aggressively pursue counter-UAS capabilities because we are now facing a host of unfriendly nations and enemies that produce and utilize UAS.

As a whole we need to deal with the evolution of future UAS threats more

effectively, and the long term solution lies in a balance between procedures and technology.

Fires Warfighting Function. With the crafting of our Army of our U.S. Army Functional Concept for Fires, TRADOC Pam 525-3-4, we have drafted a document that details what we think we will need for our Fires forces to continue to remain adaptive and confront future adversaries. By continuously evolving, we have pushed forward to start to answer our challenges and fill our known gaps.

Doctrine update. Recent operations have highlighted the value of nonlethal Fires, and in command and control warfare – now 'Mission Command,' as described in Army Field Manual (FM) 3-0, Operations. Nonlethal Fires is the key to dictating the enemy's environment. FM 3-0 also talks 'Mission Command' as a term that is replacing 'battle command' and command and control.' FM 3-0 is projected to be completed by October 2011, and with its publication it will officially bring in Air and Missile Defense into the Fires Warfighting Function. It will also further explain how, as a whole, electronic warfare, computer network operations and both lethal and nonlethal physical attack are to be integrated across the Army.

Currently, there is still a lot of discussion on whether or not EW will be formally folded under the Fires Warfighting Function, but I say it doesn't have to be 'ours' in order to effectively apply it.

Leader development: joint and combined. The biggest discussion to date on leader development is how we go about "re-redding" our Fires force. Here at the FCoE, we have specifically laid out several programs to build and rebuild our experience base, re-establish training capacity and restore senior leader oversight.

Being a Soldier is tough, arduous work, so to help our Fires force grow and be ready for the future we are not only focusing on technology but getting back to the basics – our roots. We are building on key leader attributes of character (Army Values and Warrior Ethos), intellect (critical thinking, adaptability, ability to frame complex problems, innovation and culturally astute), and being 'fit to fight' (having an expeditionary mindset, personal courage, resilience, physical fitness and competence), through various blended learning opportunities.

We have also broadened the curriculum of our officer, warrant and noncommissioned officer course to include planning, integration and application of both joint lethal and nonlethal Fires.

The FCoE has also included critical topics such as cultural awareness, joint and interagency operations, information engagement and stability operations, all with the intent of growing the FA and ADA together as the most effective, relevant Fires force in the world.

PVT Jacob Dunn fires a 155 mm round from a Howitzer during a support fire mission at Forward Operating Base Boris, Afghanistan, May 3. Dunn is a cannoneer with 2nd Platoon, Alpha Battery, 3rd Battalion, 320th Field Artillery Regiment. (Photo by SGT Derec Pierson, U.S. Army)

The way ahead. We are working to obtain the most effective capabilities sooner. Our solutions will not be just based on acquiring materiel, but using an enterprise approach that will empower our leaders to take a holistic view of organizational objectives and processes in order to act cohesively for the good of the entire organization and to achieve outputs with greater efficiency.

We will continue to work our Fires organizations into the Army Force Generation process which will allow for a steady, predictable flow of trained and ready Fires forces to meet our nation's needs. We will provide 'readiness at the best value.' We will also to continue to actively seek input from commanders at all levels; asking such questions as, are we getting it right? Are we providing the necessary tools and capabilities to deal with whatever the enemy shoots at us?

We have a wealth of talent and ingenuity among our Fires force and I encourage all units to engage, provide input and to make our Fires force even better in the upcoming year; because we all must be ' fit to fight' now and in the future. Thanks for all you do – for your attention to detail, dedication to duty, selfless service and most of all – your sacrifice.

Fit to Fight – Fires Strong!

FROM THE DESK OF
Command Sergeant Major of the Fires Center of Excellence and Fort Sill

By CSM Joseph D. Smith

As I leave the Fires Center of Excellence, I would like to send a quick close out.

Strategically, the Fires Center of Excellence is an Army success story. We have fully integrated the Air Defense and Field Artillery communities into a true center of excellence here at Fort Sill, Okla. Our ADA and FA doctrine writers live and work side by side building on the strengths of both branches as we continue moving forward. Our concept teams look at efficiencies in acquisition from a Fires perspective vice a branch perspective. The organization of the FCoE forces our branches to better understand what each of us do. We see benefits from shared training resources for common skills in our facilities. One area where I urge caution is the potential cross assignment of FA or ADA brigade and battalion command sergeants major.

Materially, our branches remain unique requiring the very best trained Soldiers and noncommissioned officers to provide Fires from mud to space in support of our maneuver brothers. Looking across the Fires force, I see our FA and ADA units operating expertly in a very decentralized and distributed manner. At the brigade level and below, our senior noncommissioned officers are "skill players" maintaining not only our Soldier standards, but those MOS specific standards our maneuver commanders depend on us for. As a U.S. Army Field Artillery brigade command sergeant major, I saw myself as the enforcer of standards across the gun line with the battalion leaders. I could do that in large part because I spent a lifetime walking that gun line.

Over the past year, as I have learned more and more about the U.S. Army Air Defense Artillery arm of the Fires force, I am sold on the importance of the ADA brigade and battalion CSM being a tried and true air defender. When employed, these units are not simply spread over a few terrain features, but entire countries. Their young commanders have to make a split second decision on when to fire. The ADA CSMs are technical experts who can rapidly identify issues in the fire direction center or launcher because they too, have walked that gun line for years.

As the branches continue to look for ways to integrate as a Fires force, I have been thinking about what level of integration we ought to seek and reach. My best military judgment is the ADA and FA brigade CSM position is not an area we should try to combine because both Fires branches will risk their effectiveness and obligation to serve the brigade as the senior trainer and advisor for their commanders. Any CSM, regardless of their MOS, can lead Soldiers. It is in the brigade and battalion CSM role as a trainer, especially in the technical MOS of the FA and ADA, that we owe our FA and ADA brigade commanders a tactically and technically expert senior trainer, coach and mentor. A Fires CSM must always be a tactically and technically expert in order to serve successfully in a brigade of highly specialized Soldiers who rely on their CSMs for both leadership and technical expertise. Fires Soldiers today are as agile and adaptive as ever, but let us never forget that precision and proficiency allow us to be on time and on target with the first round fired because we are fundamentally sound in our tradecraft.

It has been my pleasure to serve as the CSM for the FCoE and Fort Sill for the last three years; now it's time to get back to theater! See you downrange!

Fit to Fight, Fires Strong!!!

100th Anniversary of the Field Artillery School

By Keith Pannell
Editor, Fort Sill Cannoneer

Even Mother Nature seemed to want to join the 100th Anniversary of the Field Artillery School celebration at Fort Sill, Okla. as thunder, the heavenly kind – not the typical kind from howitzers rumbled in the distance May 19, 2011.

But, it was talk of thunder that comes out of the end of a metal tube, raining firepower on an enemy that dominated the ceremony in front of a small, white building on the southeast corner of Fort Sill's Old Post Quadrangle.

The little white, three-room building, the original school of Fires, opened in 1911 and ushered in a new era for Fort Sill in the early part of the century.

"We gather today to celebrate our history at this great institution, but also to link the past with the future," said BG Thomas Vandal, commandant, U.S. Army Field Artillery School. As Vandal spoke, he looked out into an audience that was a veritable who's who of former and current field artillery generals, from, Lee Baxter to Toney Stricklin to Richard Formica and David Halverson.

Vandal said the field artillery has helped shape the Army and our nation since its inception. He said Fort Sill has been the driving force in changes in artillery equipment and tactics.

Because of the poor performance of the field artillery in the Spanish-American War and the emergence of modern field artillery in other nations, the War Department sent CPT Dan T. Moore to Europe to research various artillery schools in 1908.

Upon his return, Moore impressed the War Department with what he had learned from the Europeans, especially the Germans, and was named the first commandant of the School of Fire for Field Artillery.

During the ceremony last week, Vandal, CSM Daniel Willey, U.S. Army Field Artillery School command sergeant major, MG David Halverson, Fires Center of Excellence and Fort Sill commanding general, and CSM Dwight Morrissey, Fires Center of Excellence and Fort Sill command sergeant major, unveiled a plaque dedicating the

Members of the Field Artillery Half Section stand by for the beginning of the 100th anniversary of the Field Artillery School ceremony at Fort Sill, Okla. (Photo by Keith Pannell, U.S. Army)

BG Thomas Vandal, CSM Daniel Willey, MG David Halverson and CSM Dwight Morrisey unveil the monument to CPT Dan T. Moore, "The Father of Field Artillery," May 19. (Photo by Keith Pannell, U.S. Army)

original schoolhouse to Moore as, "The Father of Field Artillery." The plaque will be hung permanently in Moore's preserved office inside the three-room structure.

"Dan T. Moore was a special person," said Halverson. "He met many large challenges when our country was in transition and he didn't back down; he worked from his humble beginnings and built this thing which has grown into the King of Battle."

The guest speaker for the celebrations was GEN Raymond Odierno, commander of U.S. Joint Forces Command, and a field artillery officer. Odierno said his earliest memories of Fort Sill was as a young captain in the summer of 1980, when he and his classmates had t-shirts printed that said, "We survived 100 days of 100 degrees."

He said he is proud of his field artillery heritage, and said it exposed him, "to a variety of experiences that provided a foundation of skills and opportunities that allowed me to develop, not only as a person, but as a professional."

As he addressed the audience of about 300 people, Odierno said he expects the field artilleryman to lead the way in developing innovative solutions for the future joint force.

"Our Soldiers are being asked to do more beyond their core competency," Odierno said. "Artillery formations have adapted and delivered, whether as counter-Fires units, infantry in other units, transportation companies or leading the way in conducting civil military operations; artillery units continue to answer the call as an integral part of our combined force."

He said warfare has changed and the field artillery must change with it. But, Fires Soldiers must be mindful of the past to appreciate the future. Odierno said the operations tempo will not slow down and neither will the responsibility placed on field artillery Soldiers like those currently in classes at Fort Sill.

"To succeed in an often chaotic and decentralized combat environment, we will demand more of our junior officers, our noncommissioned officers and our Soldiers at the tip of the spear," he said. "As we move into the second century of field artillery, the path ahead will become increasingly difficult, but increasingly vital."

Odierno said he was excited to take part in the anniversary celebration and watched as the Moore plaque was unveiled. Walter Zaremba, a graduate of the 1961 Officer Candidate School class, unveiled a 50th Anniversary monument. The ceremony culminated when 2nd Lt. Eric Null, who is currently attending the Basic Officer Leadership Course and youngest field artillery officer in the Army, unveiled the 100th Anniversary plaque.

Vandal joked he expects Null back in 150 years to unveil the anniversary plaque for that milestone.

Over the last 100 years the U.S. Army Field Artillery School has transferred from the little white, three-room school into a world re-known fire support and joint fire institution. The school has produced more than 800,000 field artillery Soldiers with a legacy that includes President Harry S. Truman, the former chairman of the Joint Chiefs of Staff, and Generals John Shalikashvili, Tommy Franks, Dennis Reimer and, of course, Odierno.

At the end of the celebration, to continue the theme of remembering the past to move toward the future, Odierno used a model 1897, French 75mm cannon to fire one round signaling the start of the next 100 years of the field artillery.

2LT Eric Null, Field Artillery School student and youngest field artillery officer in the Army, unveils the 100th Anniversary monument at the 100th Anniversary of the Field Artillery School of Fire celebration in front of the original School of Fire, which dates back to 1911. (Photo by Keith Pannell, U.S. Army)

"Learn, Adapt and Lead: Field Artillery and Fire Support"

By GEN Raymond Odierno
Commander, U.S. Joint Forces Command

MG Halverson, thank you for that introduction and for inviting me to join you and our fellow Red Legs for this very special occasion. It's an honor to be among such a team of professionals and patriots.

I'm particularly proud of my Field Artillery and Fire Support background. It exposed me to a variety of experiences that provided a foundation of skills and opportunities that allowed me to develop as a person and a professional. It provided me the opportunity to work in diverse environments and units – heavy, light and even missiles.

So I've come to appreciate the diversity of the Field Artillery Branch and what it means to be a fire supporter. It's important on this day to recognize the broader role of the field artillery in our nation's proud history and in our bright future.

Field Artillery & Fires – past and present. The history of field artillery and Fire support reflects what is best about our Army, the joint force and America. Many words have been used to describe our branch, such as the "King of Battle." But humbler, yet no less powerful words include: dedicated, adaptable, decisive and trustworthy.

Of course, this proud tradition began when the Continental Army's Chief of Artillery, Henry Knox, led an epic three-month expedition across New England to bring captured British guns to bear at the Siege of Boston. Not only was Knox a self-taught artilleryman, but he was a savvy logistician and planner.

I mention this early history because it highlights what I believe is still essential about fire support – not just the traditional core competency of gunnery – but the ability to adapt to changing conditions. It should be noted that following our victory for independence all of the Army except for the artillery was dissolved. This was in keeping with our founders' inherent distrust of a standing army, but also in recognition of the special trust placed in the artillery – and the armories which they safeguarded.

GEN Raymond Odierno speaking at the 100th Anniversary ceremony. (Photo by Keith Pannell, U.S. Army)

The ebb and flow of wars throughout our nation's history has always included challenges associated with applying new technology and sometimes re-learning old lessons despite those technological leaps. Fires leaders have repeatedly demonstrated their skilled determination and adaptability.

They did so decisively from Fort McHenry and Gettysburg to the skirmishes of the Spanish-American War and the bloody trench warfare of World War One. From the Battle of the Bulge and Kwajalein during World War Two to the conflicts in Korea and Vietnam, Fires leaders continually adapted to emerging technology, resilient adversaries and the overall environment – an increasingly complex and "6,400 mil" environment.

One particular unit close to my own heart is the 2nd Battalion, 8th Field Artillery which earned the moniker "Automatic" during fighting on the Pusan Perimeter in Korea. American GIs and even enemy prisoners of war remarked at the seemingly automatic rate of fire achieved by the 8th Artillery in support of our Infantry brethren.

But for them and other units like them, it was anything but automatic. Overcoming a shortage of weapons and a "surplus" of enemy forces, they achieved massed firepower by increasing their firing rate to exhausting levels. Dedicated. Adaptable. Decisive. Automatic.

Of course, history reminds us constantly that neither a branch of the Army, nor a single service, nor in fact the military alone can single handedly secure lasting victory. We must learn from our strategic historical lessons, but the future will

require creative individuals and leaders. I expect field artillerymen to lead the way in developing innovative solutions for the joint force.

Our recent operations in Iraq and Afghanistan underscore our historical lessons. Our Soldiers are being asked to do more beyond their core competency.

Artillery formations have adapted and delivered whether it be in our core functions of counter-fire or offensive Fires or it be as infantry maneuver units, transportation companies or leading the way conducting civil-military operations. Artillery units continue to answer the call as an integral part of our Joint and combined force. Relevancy is the key!

Our environment is constantly evolving. Warfare has changed and we've got to change with it. But we must be mindful of the past in order to appreciate change. Learning from the efforts personified in history by Henry Knox, our modern day fire supporters must be equally adaptive and focused on forging future leaders.

Artillerymen have played and continue to play a vital role in our military planning and operations. As the concept of Fires has expanded to encompass a myriad of non-lethal capabilities, it's nevertheless the field artillery which leads the effort. This underscores the importance of adaptive leaders, essential for every branch in the Army and the joint force. But particularly so for such a broad and important function such as Fires. And especially so during an emerging period of resource constraints.

Throughout our history, leadership has been key to our successes. Especially in our branch – entrusted with the most firepower – leadership has been central to the prudent and effective application of those fires.

GEN Omar Bradley summed it up when he said: "Leadership is intangible, and therefore no weapon ever designed can replace it." I would go further and suggest that no weapon can be designed, acquired and employed effectively without good leadership. The same goes for our non-materiel processes, tactics, techniques and procedures.

Learning and adaptive leadership drives innovation. Selfless leaders focused on the mission and the welfare of their Soldiers are the most willing to share their ideas and to integrate with the right partners to get the job done. The right partners in the joint force, among our allies and international coalitions, among the many international organizations and among industry and government.

The uncertain future that we face will certainly feature increasingly distributed military operations. To succeed in an often chaotic and decentralized combat environment, we will demand more of our junior officers and NCOs – the Soldiers at the tip of the spear.

Not only must our Fires evolve to support them, so too must our training and education in order to equip our young leaders for the increased burdens we place on them. Over the past century, the Field Artillery School has provided this training and proved its worth. As we move into the second century the task is increasingly difficult, but vital.

We must always strive to improve our core competency, while balancing that against an evolving operational environment and inevitable resource limitations. We must sustain our relevance to the future joint force. Therefore, we must prioritize our efforts. We must identify and assume some risk in those areas where we can't necessarily do as much as we'd like. And we must innovate solutions to mitigate that risk.

I am confident that our up and coming Fires leaders will prevail in this uncertain future. By constantly learning and adapting as leaders and encouraging their subordinates to do the same.

I am proud to be an artilleryman and fire supporter. We continue to lead and live up to the moniker: King of Battle. I challenge all of you to step up and carry on the tradition of all Artillerymen.

I appreciate the opportunity to celebrate the 100th anniversary of the Field Artillery School – a big piece of a long, illustrious history of Fires in support of a great nation. Thank you for being here today, for your attention and for your continued service. God bless you.

General Odierno serves as commander, U.S. Joint Forces Command, located in Norfolk, Va.

The command focuses on supporting current operations while shaping U.S. forces for the future.

Odierno oversees USJFCOM's roles in joint concept development and experimentation, joint capability development, joint training, and force provision and management as outlined in the Department of Defense's Unified Command Plan.

Prior to assuming his current duties, Odierno most recently commanded Multi-National Force – Iraq and then U.S. Forces – Iraq from September 2008 to September 2010. He oversaw the transition from surge to stability operations and directed the largest redeployment of forces and equipment in 40 years. He assumed command of MNF-I less than seven months after completing a 15-month deployment with III Corps as commanding general of Multi-National Corps-Iraq from December 2006 to February 2008.

A native of New Jersey, Odierno graduated from the U.S. Military Academy at West Point in 1976 with a commission in field artillery. During more than 34 years of service, he commanded units at every echelon, from platoon to theater, with duty in Germany, Albania, Kuwait, Iraq, and the United States. After his first assignment with U.S. Army Europe, Odierno was assigned to the XVIII Airborne Corps Artillery at Fort Bragg, N.C., where he commanded two batteries and served as a battalion operations officer.

100 Year Celebration

By BG Thomas Vandal
Commandant of the U.S. Army Field Artillery School

GEN Odierno, MG Halverson, other general officers, distinguished guests, friends and family members of our Lawton-Fort Sill community…. Thank you for joining us today for this historic ceremony. I'd like to extend thanks to Senator Inhofe and Senator Coburn for their Senate Resolution 168 and to State Representative Dorman for the Oklahoma State Proclamation 1018, honoring the 100th anniversary of the school of fire for the field artillery at Fort Sill, Okla. I'd also like to give a special welcome to Mrs. Patricia Lynn Paulk, granddaughter of SGM Lynn Boggs, the first SGM of the Field Artillery School, COL (R) Walter Zaremba from the 50th Anniversary Class of 1961, and 2LT Eric Null, the youngest member of the Field Artillery School and the one we have tasked to represent all of us at our 150th reunion ceremony in 2061. 2LT Null, your mission is to return to Fort Sill in another 50 years so mark your calendar.

We gather today for the purpose of celebrating our history at this great institution, but also to link the past with the future. Ultimately, we are all part of this great history of Fort Sill and the United States Army. Many of you in the audience today have helped to shape the very history that we commemorate. You all have much to be proud of as we review the legacy of this institution.

The Field Artillery School has a long and storied history that helped shape the Army and our nation since its inception. It has been the driving force for changes in artillery tactics and equipment, molded by the needs of the operational force. As our Army evolved to meet the challenges of the last Century, so did the Field Artillery School to meet those requirements.

This prestigious school began at the end of the 19th Century when President Theodore Roosevelt initiated the transformation of the Army into a modern force.

Due to the poor performance of the field artillery during the Spanish-American War, and the emergence of modern field artillery in other nations, the War Department sent Captain Dan T. Moore to Europe in 1908 to research the various Artillery Schools.

CPT Moore's impression of the German artillery school caused him to adopt their model because of their advanced methods of fire, testing of new materials, and the integration of live fire training. He convinced the War Department to implement the lessons he learned, and was selected as the first commandant of the "School of Fire For Field Artillery". From its genesis in 1911, the School emerged as a worldwide leader in training and educating field artillerymen, developing fire support tactics, and field artillery systems.

During World War I, the school trained Soldiers in observed indirect fire for duty in France using classroom instruction and practical field exercises. According to the commandant, Major General William J. Snow, the school produced officers who performed with distinction in World War I.

Redesignated the Field Artillery School in 1919, it employed innovative training techniques in the classroom and in the field, and helped to develop new field artillery systems during the 1920s. Majors Brewer and Ward, the directors of the Gunnery Department in the 1930s, developed the fire direction center, introduced the graphic firing tables, and the portable radio, to ensure accurate and responsive massed fires during World War II. So effective was the training that artillerymen received here, that GEN George Patton stated, "I don't have to tell you who won the War, you know the artillery did".

Following World War II, the Field Artillery School continued to expand, retained its leadership in innovative instruction, and participated in key combat developments. During the 50's, the school trained Soldiers as part of The Artillery Center, which included the Anti-aircraft Artillery School and the addition of our Marine Redlegs. Although the Vietnam War caused the school to focus on fire support in counter-insurgency, it returned to conventional warfare training in the 1970s. For the next three decades, the school introduced counter-fire and the fire support team, and helped to develop the multiple launch rocket system, Paladin howitzer, and target acquisition systems. The school also modernized its classrooms using automation and small group instruction.

Today, we train field artillerymen to be technically and tactically proficient and to provide lethal and nonlethal effects in support of full spectrum operations.

In 2003 the United States Army field Artillery Center introduced the Joint and Combined Integration Directorate to train joint fires with the Air Force. The creation of the Fires Center of Excellence in 2009 included the return of the Air Defense Artillery School to its original home at Fort Sill.

Over the last 100 years, the Field Artillery School has transformed from this 3 room building behind me into a world renowned fire support and joint fires institution. Over our history, 800,000 Soldiers have passed through the school to become professional Redlegs and adaptive leaders with the ability to provide full spectrum fire support throughout the world.

It has produced a proud legacy of national leaders that include President Harry S. Truman, and legendary 4 Star Commanders such as GEN Shalikashvili, GENs Vuono, Peay, Reimer, Westmoreland, Merritt, Franks, and Odierno to name a few.

The school's enduring mission can be summarized by the following quote from the former assistant commandant of the Field Artillery School, COL Butner, who in 1923 stated:

"The subject of field artillery is a life study and the school hopes to lay the foundation on sound principles for such study. The artillery officer must continue the study of his profession, or he will fail when the time comes to practice it. And failure in war means failure in life, for the Soldier."

Clearly, this statement applies as much today as it did then.

At this time I'd like to introduce the senior field artilleryman in the Army, and the commander of Joint Forces Command. He has commanded at every level in our Army and has made a lasting impact on Soldiers throughout the Army.

BG Thomas Vandal speaking at the 100th Anniversary ceremony. (Photo by Keith Pannell, U.S. Army)

Sir, we are honored that you would take time out of your busy schedule to recognize the 100th Anniversary of the United States Field Artillery School.

At this time, I would like to ask GEN Raymond Odierno to come forward as we render honors on his behalf.

As I close, I want to thank you all again for attending this historic ceremony, and for being a part of the field artillery school's proud legacy.

Thank you all for making this a memorable event that will be looked back on at the 150th celebration of the Field Artillery School.

Fires Strong!

King of Battle….

Brigadier General Thomas S. Vandal graduated from the United States Military Academy at West Point in 1982 where he was commissioned a Second Lieutenant in the field artillery. His military education includes the Field Artillery Officer's Basic and Advance Courses, Combined Arms Services Staff School, Command and General Staff Officer's Course, and the National War College.

Vandal's initial assignment was with the 75th Field Artillery Brigade, Fort Sill Okla., where he served in the 1st Battalion, 17th Field Artillery as the B Battery fire direction officer, executive officer, and battalion fire direction officer. Upon completion of Field Artillery Advance course in 1986, Vandal was assigned to Baumholder, Germany, where he served as the battalion plans officer and B Battery commander in the 4th Battalion, 29th Field Artillery, 8th Infantry Division (M). After Command and General Staff College, Vandal served in the 2nd Battalion 82nd Field Artillery 1st Cavalry Division as the brigade fire support officer and battalion S-3. He also served as S-3 and executive officer for the 1st Cavalry Division Artillery. Vandal commanded the 1st Battalion, 37th Field Artillery, 3rd Brigade Combat Team, 2nd Infantry Division, Fort Lewis, Wash., and the 75th Field Artillery Brigade, Fort Sill, where he deployed to Iraq in support of the 1st Cavalry Division. After brigade command, Vandal served as the commander of the Operations Group at the Joint Multi-National Readiness Center in Hohenfels, Germany for three years. In 2008, he was assigned to the 3rd Infantry Division where he served as the deputy commanding general (S) for the Marine Division. While assigned to the 3rd Infantry Division, Vandal deployed to Operation Iraqi Freedom and Operation New Dawn in Iraq as the deputy commanding general for U.S. Division-North.

Vandal assumed responsibility as the 48th commandant of the U.S. Army Field Artillery School in December of 2010.

Fires capability for wide area security & combined arms maneuver

From May 16-20, members of the Fires community gathered at Cameron University, Okla., for the 2011 Fires Seminar

Employment of Fires at tactical levels

By Paul E. Jiron
Assistant Editor

Fort Sill's Fires Center of Excellence convened a panel of experts to discuss "Employment of Fires" at the 2011 Fires Seminar. The panel consisted of three lieutenant colonels with recent deployments to Iraq and Afghanistan. LTC Michael Morrissey, former commander of 5th Battalion, 5th Air Defense Artillery, who served in Iraqi Freedom and Operation New Dawn, focused on the importance of joint Fires and the successes of Counter-Rocket, Artillery and Mortar, better known as C-RAM. Next, LTC John Delaney, former commander of 3rd Battalion, 321st Field Artillery, 18th Fires Brigade (Airborne) who served recently in Operation Enduring Freedom, discussed the mission of the 18th Fires Brigade (Airborne). The panel was rounded out with LTC Bill Golden, who served with the 160th Special Operations Aviation Regiment (Airborne); he discussed 160th Regiments keys to success and fire support products.

Morrissey started the discussion by stating that enemy indirect fire is a dangerous portion of the operational environment in Iraq, and despite significant improvements across the Iraqi theater of operations and formation of the Iraqi government, indirect fire continues to threaten U.S. forces. Currently, friendly forces bear several indirect fire attacks per week, Morrissey said. The majority of which are multiple round attacks that can vary in size from 60 mm mortars to 122 mm rockets.

He went on to state that 5th Battalion, 5th Air Defense Artillery was the core of Joint Task Force 5-5, which was comprised of Soldiers, sailors and more than 70 civilian contractors, who were assigned to protect friendly positions by using sense and warn capabilities. Task Force 5-5 was spread out in more than 16 non-continuous bases from Mosul to Basra and required a great deal of logistical support to maintain its functionality. He said Task Force 5-5 was responsible for providing 589 warnings along with 33 intercepts.

Task Force 5-5 benefited greatly from lessons learned by previous units and from commanders out in the field, Morrissey said. "It was the young NCO making it happen," he said. Junior Soldiers were responsible for the success of Task Force 5-5.

Delaney followed Morrissey and his topic stirred up much discussion. In Afghanistan, the U.S. was shooting a lot of rockets and cannons, Delaney said. There have been more than 40,000 (he predicted closer to 50,000) 155 mm projectiles fired from the M777 howitzers and more than 450 HIMARS rockets fired. The mission of the 18th Fires Brigade (Airborne) was to deploy an FFA Headquarters, 2 M777 howitzer batteries, one HIMARS battery and one TAB battery until relieved, to Operation Enduring Freedom in order to provide timely and accurate Fires and target acquisition in support of RC-East

SGT Christopher Hatton, 1st Battalion, 320th Field Artillery Regiment, 101st Airborne Division, "Top Guns," provides security April 1, in an orchard outside Tarok Koloache village in Arghandab District, Hatton. (Photo by SGT Breanne Pye, U.S. Army)

and special operations forces. LTG Richard Formica reinforced the importance of having an FFA Headquarters, which was discussed later in the week.

Delaney explained his M777 batteries were split up into three, two-gun firing platoons, each having its own platoon leader, platoon sergeant and fire direction center. The HIMARS battery was also split up into two launcher platoons. Along with the firing batteries there are also three, Q-36 radars, and one, Q-37 radar deployed with the brigade. The HIMARS batteries rotated every six months, while the M777 and TAB batteries rotated every 12 months, he said. The 18th FiB assumed the HIMARS mission in 2006, the M777 mission in 2007, and it's projected the 17th FiB will assume the mission in Afghanistan sometime in 2012.

Next, Delaney discussed the concept of an FFA Headquarters. First, he stated the composition of an FFA HQ's. It is comprised of one LTC, one MAJ, two CPT's, one WO1/2, one CSM/SGM, one 13B40 (Master Gunner), one 13D40 (Master Gunner), one 92Y30 (unit supply specialist), one 45B (small arms/artillery repairer), and two 13D10's (Field Artillery Tactical Data Systems specialists). The purpose of the FFA HQ's is to:

- Supervise and execute the M777 certification program
- Manage and monitor 155mm ammunition actions and issues
- Manage and monitor M777 maintenance/float operations in RC-East
- Sensor Manager for RC-East (Fire Finder, LCMR, C-RAM, UTAMS)
- Secondary C2 and administrative support to deployed 18th Fires units
- Support the FSCOORD and Division FSE with Field Artillery and Mortar issues and standardization

Delaney went on to state the FFA battalion is extremely effective, and it works in this type of environment. He also predicted when the U.S. decides to begin scaling down its forces in Afghanistan; the FFA HQ's would be one of the first things to go. Delaney warned this would be a mistake, and there is a true need for it.

Next, Delaney reiterated the field artillery is actively shooting in Afghanistan, and the requirement for a 24-hour, all-weather fire support system remains. Further, he said, "accuracy is a must" and any collateral damage ended up being a significant setback for U.S. forces. Delaney went on to state we must be responsive and accurate in order to ensure our relevance and reinforce our reputation in theater.

Management of the five elements of accurate and predicted Fire was the next topic discussed. The five elements of accurate and predicted Fires are:

1. Target location and size;
2. Weapon location;
3. Weapon and ammunition Information;
4. MET data;
5. Computational procedures.

"Management of the five requirements remains the essential task," Delaney said. It is also the primary mission of the fire direction officer and fire direction non commissioned officer at platoon level, and it is a 24/7 requirement that ensures the standards of precision are always met, he added.

Excalibur was discussed next. Delaney stated his mission in Afghanistan did not require it, but the Marines often use it for enemy engagements in southern Afghanistan. He mentioned while there was sometimes the need for it, brigades and forward observers did not have the trust and confidence of firing Excalibur. During later discussion with seminar attendees, Delaney stated the 18th FiB did not have the opportunity to train during pre-deployment with Excalibur because of a lack of ammunition. He noted that the first time they fired Excalibur was in theatre.

The panel of experts was rounded out by LTC Bill Golden, who was an Apache pilot prior to serving with the 160th Special Operations Aviation Regiment (Airborne). Golden discussed the 160th's mission, which consisted of successful joint Fires integration and fire support products.

Golden reiterated the importance of a habitual relationship with supported Joint Special Operations Task Force ground forces and Air Force Special Operations Command direct support aircraft. Golden stated ground forces and supporting aircraft crews live, train and fight together as one. He went on to explain intelligence, surveillance and reconnaissance, and fixed wing integration is critical, and during a mission it is important to understand each other's techniques, tactics and procedures.

Next Golden talked about stateside training with ground forces and supporting aircraft. He stated that training was intense, with one battalion conducting 34, one-week long training events per year. More than half of these 34 events have fixed wing and ISR assets integrated into the scenario, and every event utilizing air assets has corresponding ground forces.

Golden went on to explain that organic 13A/13F Joint Terminal Attack Controllers within the 160th special operations aviation

A Soldier patrols an orchard near the Tarok Koloache village in Arghandab District during a mosque opening ceremony. (Photo by SGT Breanne Pye, U.S. Army)

regiment and supporting units were the key to mission success. The six Army JTAC'S serve as the unit's subject matter experts on close air support training and integration. They are also responsible for planning, coordinating and executing joint air/ground live fire exercises. He said JSOTF is focused on engagement in the find, fix, finish, exploit and analyze (F3EA) special operations forces model. He noted 160th relied on extensive use of unmanned aircraft systems.

Golden finished up by discussing 160th Forward Area Controller (Airborne) Program. According to

Marine Aviation Weapons and Tactics Squadron One FAC(A) Handbook, FAC(A) duties include detecting and destroying enemy targets, coordinating or conducting target marking, providing terminal control of CAS missions, conducting air reconnaissance, providing artillery and naval gunfire air spotting, providing radio relay for the tactical air control party and forward area controllers, and performing battle damage assessment. Golden stated the FAC(A) Program facilitates air/ground integration in training as well as in combat.

Editor's Note: To read a more detailed account LTC Morrissey's experiences with C-RAM in theater, go to page 34 in this edition of Fires.

US Army Functional Concept for Fires

By Sharon McBride
Editor-in-Chief

The ongoing development of TRADOC Pam 525-3-4, The United States Army Functional Concept for Fires, was discussed May 18 at the 2011 Fires Seminar.

LTC Mark B. Elfendahl, the chief, Joint and Army Concepts Division at the Army Capabilities Integration Center, U.S. army Training and Doctrine Command, Fort Monroe, Va., kicked off the discussion by providing background information on how the AFC for Fires is appropriately nested with the Army Concept Framework. This framework includes five other Army Functional Concepts which cover mission command, intelligence, movement and maneuver, protection, and sustainment. All six AFCs, including the one for Fires, build upon the ideas presented in the Army Capstone Concept and the Army Operating Concept. He said these documents present broad capabilities the Army will require between 2016 and 2028.

"All these documents provide an idealized view of how as an Army we should go forward," Elfendahl said. "They all also identify operational adaptability characteristics that are paramount to mission success."

All these documents, including the AFC for Fires, also focus on twin areas of concern; which are wide area security and combined arms maneuver, Elfendahl said.

Wide area security is the application of the elements of combat power with other military and civilian capabilities to deny the enemy positions of advantage; protect forces, populations, infrastructure, and activities; and consolidate tactical and operational gain to set conditions for achieving strategic and policy goals.

Combined arms maneuver is the application of the elements of combat power in a complementary and reinforcing manner to achieve physical, temporal, or psychological advantages over the enemy, preserve freedom of action, and exploit success.

"These six functions provide a means on how we are going to fight crafty, adaptive enemies," Elfendhal explained. The AFC for Fires, with its direct linkage to the Army Concept Framework, is designed to outline what full spectrum operations will involve, complete with what core competencies Soldiers will need in order rapidly transition between missions.

Currently, there are several factors driving revisions for all the AFCs, he said. The unveiling of a new national security plan, as well as revised warfighting challenges are currently being taken into consideration since the drafts of these documents in 2010.

"We have the basics, but now we looking at moving through FY 12 and beyond," he said. Functional solution assessments will look at how well the AFCs, ACC and AOC have been used and developed to the unit level, along with determining what gaps exist, he said.

COL Steven L. Hite, chief of Field Artillery Concepts at the U.S. Army Fires Center of Excellence, continued the discussion by summarizing the changes that have been completed to date in updating the AFC for Fires.

The AFC for Fires, along with the other documents that make up the Army Concept Framework, is scheduled to be revised every two years. So along those notes, he appealed to professionals in the Fires field to provide much needed input.

"Are we getting this right?" Hite asked. "In order to adjust fire we are dependent on information that we get from the Fires force. Are we getting the most bang for our buck with our AFC for Fires?"

Black Dragons, 5th Battalion, 82nd Field Artillery Regiment, 4th Advise and Assist Brigade, 1st Cavalry Division, fire M109A6 Paladins during a certification exercise. (Photo by SPC Terence Ewings, U.S. Army)

What the Army must do. Future Army forces do not have a choice, they must conduct combined arms maneuver,

Hite continued. They also must defeat the enemy in close combat in order to seize and retain the initiative. All must also conduct wide area security to consolidate tactical and operational gains.

Strategic decisions are also being pushed down to Fires professionals at lower and lower levels, he said.

"In today's fight every Soldier must know how they fit into the bigger picture and what the nation's goals are," Hite said.

All Soldiers, not just those at the senior level, must understand complex situations in width, depth, and context to foster disciplined initiative within the commander's intent, Hite added. They must have the ability to build and maintain relationships with diverse partners to achieve unity of effort.

Communication not only amongst ourselves and with joint and coalition partners is key to mission success but, within varying systems that are found across the services and multinational partners, Hite said. Our Fires Soldiers must not only protect these information and communications systems; they must retain the ability to fight degraded communications by fighting in and around enemy and civilian populations.

"They must conduct reconnaissance in close contact with enemy and civilian populations," Hite said.

All this must be accomplished in front of a 24-hour news cycle. With the development of cable, satellite and internet news, we have entered an information world where news programming is available 24 hours per day, and as a result, anyone, anywhere can see coverage of our Fires operations, too.

Future operational environment implications. Our Fires professionals must continue to identify, locate, target and engage threats with increased discrimination, Hite said.

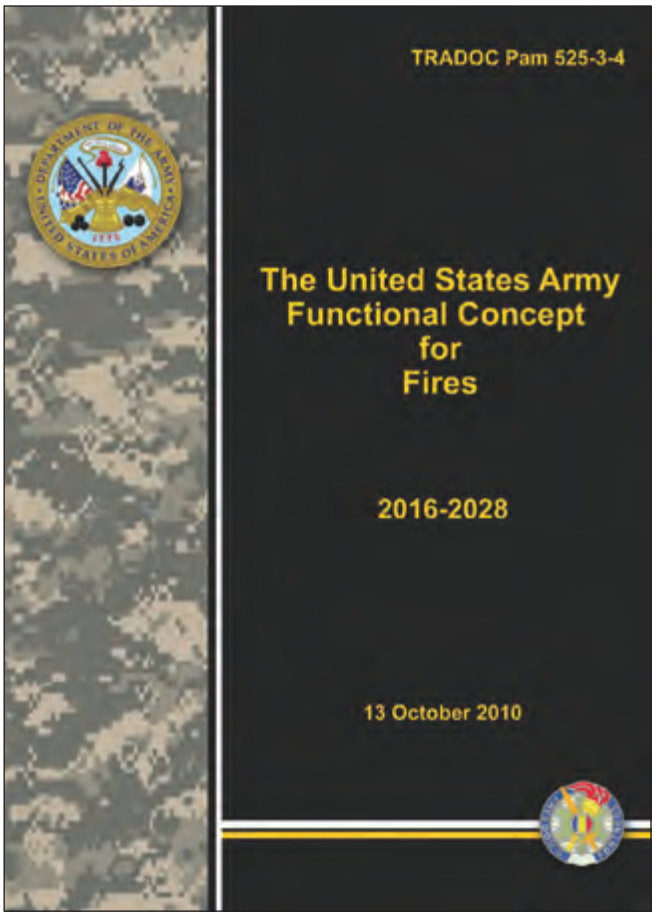
Our Army continues to experience the challenges associated with conducting operations in environments that require precision Fires and the proportional use of force in order not to alienate the very populations that we are securing, Hite explained. Operations in complex and uncertain environments will continue to be the norm.

Preventing fratricide, mitigating collateral damage, and reducing residual hazards to accurately and precisely identify, classify, locate and track threats to increase the Army's capabilities to reduce uncertainty remains a top priority, he stated.

"We must rapidly discriminate friend from foe," Hite said. The future force must protect friendly forces, populations, and critical infrastructure at home and abroad. Fires solutions must be effective (achieve the required results) and efficient (expending only the resources required to be effective).

The AFC for Fires will continue to expand, he said. As more lessons learned and recommendations from the field continue to be incorporated, indirect Fires (field artillery and mortars), air and missile defense, joint Fires, and electronic attack will all play an increasing part of how we operate. Distributed Fires capabilities for decentralized operations will also continue to be the norm.

Fires military problem. Hite briefed that uncertain and complex future operational environments will continue to challenge Army Fires to develop capabilities and operationally adaptable Soldiers, leaders, and organizations who can access, clear, and employ joint, Army, and multinational Fires in support of full-spectrum operations, providing timely and responsive offensive and defensive Fires over wide areas.



The following is the synopsis for the solution to the Fires military problem: provide the optimal target, sensor, and fires capability match, attack a wide range of targets effectively and efficiently, operate in a wide range of operational and environmental conditions, and train Soldiers, leaders, and units to be full-spectrum operations capable.

Providing offensive Fires (preempt), defensive Fires (protect), and scalable capabilities are also part of the solution, Hite said.

Employing versatile Army Fires capabilities that include leaders and Soldiers skilled in core competencies and non-Fires tasks, conventional to precision capabilities (area, near-precision, precision), lethal and nonlethal capabilities, the ability to mass in time and space, and the ability to task organize into composite units and smaller firing elements, are all being explored as part of the solution, Hite briefed.

The potential for mixing U.S. Army Field Artillery and Air Defense Artillery systems is also a distinct possibility, as well as the continuous process of integrating joint, Army, and multinational capabilities.

Complementary and reinforcing capabilities provide redundancy that is needed, Hite stated. Maintaining communications across extended distances is also needed.

Required capabilities. We need to add more maneuver capabilities across our Fires force. This is especially the case with our Counter Rocket, Artillery, and Mortar system. We must also continue to develop capabilities to defeat cruise and ballistic missile attacks, Hite stated.

We must also provide joint and multinational interoperable fire support from the component to the platoon level to coordinate and synchronize Fires, he said. Fires must continue to encompass a wide range of precision to conventional capabilities, as well as the ability to locate ground targets accurately in order to employ a range of conventional to precision capabilities.

Fires professionals must also be able to classify, identify, and discriminate friendly, neutral, unknown, and hostile aerial objects to enable rapid engagements, he added.

Fires will continue to be all-weather capable and effective under any operational condition, he concluded. Versatile Fires capabilities will provide multiple means to achieve the right effects and minimize unintended consequences.

The United States Army

GEN Robert Cone talks training, profession of combat arms

By Mark Norris

The Army Capstone Concept now looks to the future, in terms of joint warfighting's hierarchy, to seek and define the Army's future role. Once determination is made on that role, the focus moves to the U.S. Army Operating Concept, then further defines it as functional concepts for each of the Army's functions. Working within a two-year cycle, updated joint warfighting concepts pave the way for new operating and functional concepts in accordance with revised warfighting doctrine's way ahead. Today, lessons learned from the last eight years of fighting are key to each concept.

Before Al Qaeda's Sept. 11, 2001, attack on the Pentagon and World Trade Center, the Army's structure of divisional command normally directed combat operations from the top down. Each individual field commander required higher orders in their conduct of combat operations. This traditional framework failed to stress commanders in the field as the most important actors in operations. Afghanistan combat missions in Operation Enduring Freedom and Operation Iraqi Freedom changed that. Today's revised Army Operating Concept looks to the commander in the field, mission command, not higher echelons to make decisions as situations present themselves on the ground. It is the mission commander's relationship with his unit, joint 'boots on the ground,' the local population, interagency, intergovernmental, and multinational partners that drives mission accomplishment. The versatile decisions of field commanders are winning the fight. Today's Army Operating Concept states, "the individual mission command officers conducting the mission enables an operationally adaptive force that anticipates transitions; accepts risks to create opportunities; informs friendly and joint, interagency, intergovernmental, and multinational partners; and influences neutrals, adversaries, and enemies. The ultimate outcome results in successful full spectrum operations."

The challenge now, as both wars now wind down, is to merge the operational expertise theater commanders have gained over the past eight years into the Training and Doctrine Command institutional schoolhouse. This was the new TRADOC Commander GEN Robert Cone's central message to leaders at this year's 2011 Fires Center of Excellence Fires Seminar, held at Lawton, Oklahoma's Cameron University.

"The world as we know it, is about to change in December of this year," Cone said in his opening Fires Seminar remarks. "Every discussion we've had over the past eight years has focused on Iraq, Iraq, and Iraq. I recognize the importance of our current efforts in Afghanistan. But any way you look at this, the demand for our presence there is going to decrease. As forces now and then return to home station units, training and retraining should be the responsibility of those home station units."

Cone, who most recently served in Iraq as III Corps commander (March 2010 through February 2011), and during other tours led the Joint Forces Command's Lessons Learned Collection Team and served as the Afghanistan Combined Security Transition commander (2007), stated the many operations conducted over the last eight years have forced commanders in the fight to make up their tactics as they went along. There were no warfighting precedents to assist the counterinsurgency brigade combat team's fight which included protection for innocent civilians, liaison with local villagers and working with local governments.

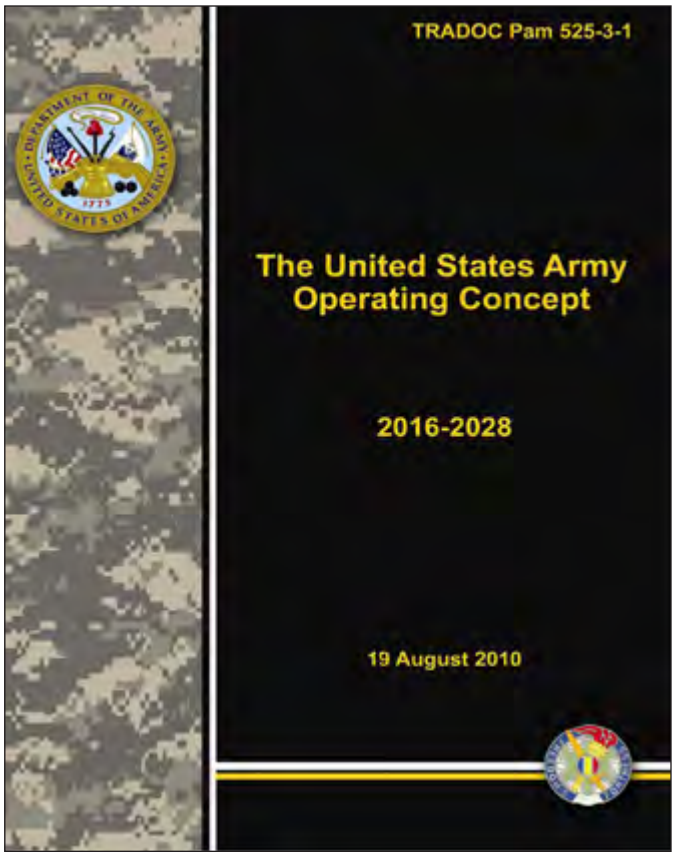
"We can't continue in a post-Iraq time frame, making it up as we go along," Cone said. "We need the war expertise of those 'A-talent' commanders who made it up, made it work, and kept it up — in TRADOC schoolhouses to pass their wisdom along."

During 'the surge' the Army did not take time to listen to field commanders' input on learned combat tactics, he said. Instead, troops were force fed with specific objectives and prescribed situational training lanes at combat training centers. "It was training like nothing you've ever seen," Cone said.

Needing the imparted knowledge of the successful theater commanders in TRADOC was not only Cone's major Fires Seminar discussion point; it was also his acknowledged greatest challenge faced by TRADOC today.

CPL Brandon Lamb, an infantryman assigned to Company C, 1st Squadron, 14th Cavalry Regiment, 1st Advise and Assist Task Force, 1st Infantry Division, coaches Iraqi Army Soldiers while Pvt. Amar Abdul Hussein, Commando Company, 15th Brigade, 12th Iraqi Army Division, demonstrates the techniques during marksmanship training at the 15th Brigade headquarters in Kirkuk province, Iraq, April 4, 2011. (Photo by SPC Andrew Ingram, U.S. Army)

Operating Concept:



The growing gap. Cone stated there is a growing gap between the operating and generating force.

"Merging the Army's operational and training sides by bringing the young theater officer and noncommissioned officer corps into our TRADOC culture won't be easy," Cone said. "The fact is, those in operational command will never volunteer to move out of their position to teach in a school what they know to those who need it. So we have to make this a part of the system now. Caring about people, the true art of mentoring is basically looking at people's professional considerations, and their personal considerations."

When tasked to make important training changes while commanding the U.S. Army National Training Center, Fort Irwin, Calif., he said TRADOC wasn't equipped to help make those changes.

"Doctrine that's not being used by 51 percent of the force quickly becomes irrelevant," Cone said. "We now have as great an opportunity as we had at the end of the Vietnam War to develop new training based on lessons learned in Iraq and Afghanistan. We need to bring talent and experience back to TRADOC to make our organization relevant to this young generation of officers and noncommissioned officers."

Former TRADOC Commander and the current Army Chief of Staff GEN Martin Dempsey, is now working to blend theater-developed lessons learned and tactics, techniques, and procedures by cutting the number of field manuals to those relevant to the last eight years. He's also distributing current combat knowledge in a 'Wikipedia' format throughout the ranks.

Cone stated he believes there has been a disturbing separation of the Army's intellectual and operating traditions. The regular agenda of Army leaders who carve out deliberate career paths, moving from operational assignments to the school house, including college, then back, may soon change. To get the needed warfighting doctrine out of Iraq and Afghanistan's proven leaders, career interventions may be in the offing, to get the job done.

"In 2005 and 2006 when faced with the possibility of losing the Iraq war, we reacted appropriately and did everything we needed to do," Cone said. "We kept proven leaders where they were succeeding to develop their career models in the fight. But then the other side of the force found themselves outside of the operational model."

"Is there that big a difference between a guy who got to go once; and another who never did? I'll tell you as the guy who commanded Combined Security Transition Command Afghanistan, about 50 percent of those who reported became my personal protégées. One or two of them are general officers today… so it does make a difference."

A new TRADOC 'greening.' "Quite frankly, despite the tremendous success we've had with civilians we've hired, TRADOC has to become greener," Cone said. "When we talk about the profession of combat arms, doctrine needs to be in the hands of someone who wears a green suit. We must identify the right mid-career professionals who want to broaden their experience. In the process, the Army may start blocking lieutenants and captains from continuing on.

"There was nothing sadder for me when asking young Soldiers just reporting in Iraq what their best training had been, and they said 'from a civilian contractor.' We've got a serious problem training if the best training in our Army is coming from civilian contractors, and not from noncommissioned officers and officers," Cone said.

"In 32 years of service, my attitude has been, when my subordinates fail, I say, hey, this is an all volunteer force, and nobody joins the Army to fail. So when someone doesn't measure up, the first place leaders need to look, is at themselves," Cone said. "There are bad people in the Army, but there are so few, no one has to change their personal approach over it. Ninety-nine percent of Army failures are due to the fact leaders didn't make their expectations clear about what they wanted, or failed to ensure they had taken time to train and teach their subordinates to successfully accomplish the task. And I can tell you that from my experience of being a company tank commander, all the way up to being the DCGO/Corps commander Iraq, you give a bunch of staff commanders a vague task, and it's something they've never done, and you get a wide-eyed unknowing 'Bullwinkle look' that you got from a SPC 4 20 years ago."

As the new TRADOC commander, Cone now owns seven of GEN Dempsey's new change focus areas. Cone stated he believes the Army today has as big an opportunity to revise for practical application new warfighting tactics, techniques, and procedures, as we did in the years following Vietnam. He also recognized the 'heavy lifting' of the Fires community in Afghanistan and Iraq since 2001.

Fires Center of Excellence acknowledgements. "When the Army got into the business of effects, leaders like GEN Formica took the rigor of mastering both the technical and the tactical the Fires community brings, then applied that to an area of the war lacking effective information and effects operations," Cone said.

Cone also praised Fires brigades for earning reputations as the, "finest units owning battle space involved in the fight." He commended the Fires force for their ability to adapt to the many in-lieu of mission theater

assignments and for taking on, "more than our share of them." Field artillery units have trained local police, security force assistance forces, and have conducted base unit defense, logistics convoys, route clearance, and C-RAM missions.

"It was the best work that could be found in any battle space," Cone said. "The enemy has gone to school on C-RAM missions because it's so frustrating to them.

"Fires today includes air and missile defense and electronic attack," Cone added. "This inclusive approach shows the strength of the Fires branch in terms of its intellectual depth and agility." He then acknowledged his personal observations of recently combined U.S. Army Field Artillery and Air Defense Artillery progress as very encouraging.

"I'm not sure we have it right, I'm sure there are other things that we could potentially migrate," Cone added, "especially in effects, so we'll work on it." He also recognized the need to train Soldiers in both branches to not understand their branch identity, but the larger combined FA/ADA commitment to the Fires mission.

Resetting FA core competencies lost to theater infantry-tasked COIN missions was acknowledged by Cone as a primary goal. "To be as adaptable as you artillerymen have been has cost a significant price," Cone said. "There are many young artillery leaders who have never served in an artillery battalion. We need to see and deal with those challenges as we move to the future."

The Fires force role in leveraging. Cone stated a key to upcoming operations includes the ability to leverage joint interagency and multinational capabilities. A big challenge will be to ensure lessons learned from last 10 years of war.

"There are those who will want to reconstruct what happened in the last 10 years to advocate specific branch positions," Cone said. "I think we saw a little of that when we recently went into Libya; when talking about the deliverance of precision Fires from certain specific platforms that are not in the Army.

"The reality is, we learned a lot of hard lessons in the summer of 2003, as we saw what happened when we moved from a 'shock and awe' campaign to the reality of the need for 'boots on the ground.' There are some hard questions to be addressed today about the true efficiencies of the delivery of Fires," Cone said. "You must have 'boots on the ground' before you can decide how the proper mix of Fires are delivered."

When commanding the 2nd Brigade, 4th Infantry, Cone said he and staff were stunned to discover they had built a ground network using lasers that enabled them to identify, from a Bradley Fighting Vehicle, a 10-digit code that could be passed internally, but not to any element of the joint network.

Iraqi soldiers assigned to 3rd Battalion, 11th Brigade, 3rd Iraqi Army Division, maneuver toward the final of three objectives during a live fire exercise at Ghuzlani Warrior Training Center, March 31. The Iraqi soldiers demonstrated the enhanced combat skills acquired during a month of partnered training with U.S. Soldiers of 1st Squadron, 9th Cavalry Regiment, 4th Advise and Assist Brigade, 1st Cavalry Division, during the culminating battalion level live fire exercise. The 3rd Bn., 11th Bde., 3rd IA Div., is the third IA unit to complete the month long training exercise at the training center. (Photo by SPC Terence Ewings, U.S. Army)

"The current reality is, as much as we've had work-a-rounds and point of entry of how the data is passed, this still remains a problem," Cone said. "If we're serious about a joint communications system, we need a real network that will allow everybody to be a part of that. I know there's significant testing ongoing on that, but it will continue to be a challenge. When we have the network, I think for the first time we'll talk about the true delivery of joint precision Fires."

The art of training. Cone stated that he sees training today as one of the major challenges the Army will face in the future. "It is what commanders do," he said, calling it a 'commander-centric' business.

"The moral responsibility of preparing Soldiers to go into combat is that of the commander," Cone said. "Training is a leadership philosophy. Today our force returns home from Iraq and Afghanistan to face uneventful, constrained garrison life; and our commanders must accept the responsibility to train these Soldiers."

While as the III Corps commanding general, Cone said he directed his commanders to fully engage these training needs, and yet half of them failed to respond. "You talk to people on training and most say, 'oh this shouldn't be a problem' – but, I tell you it is a problem that must be addressed."

The art of thinking through training objectives; the idea of designing a training strategy, building broad commitment in an organization including involvement from subordinates, executing a training plan, conducting assessments, and owning that as a battalion commander is not uniformly accepted in the force, Cone said.

He also announced that one of GEN Dempsey's main initiatives as new Army Chief of Staff is a revolution in home station training. "But the revolution has got to start in the mind of the commander," Cone said. "The battalion commander must take ownership of his Soldier's training. If they don't take ownership, life in their garrison will be awful boring, because the reality is, training, is what warriors do when they're not down range."

The sergeant gap. "The ship is slowly turning now in NCO academies and the Army Warrior Leader's Course conferences, but the biggest problem we have right now in the Army is the amount of effort we're putting in to growing young sergeants," Cone said. "It's the weakest element of our formation."

Weak formations are defeated on the battlefield. "Afghans grow up dreaming of bad weather that takes away our (intelligence, surveillance, and reconnaissance), which takes away our helicopter support—just about everything except Fires—to go one-on-one – with an American formation (means) to run it down. Essentially, this is what we've seen."

Areas ranging from suicide prevention, to basic Soldier care, have to do with the amount of schooling the Army is asking E-5's to complete. "We've been so focused on the higher echelons of the formation that we've really short-shifted these kids, and have not set them up for success."

For example, the Warrior Leaders Course has been cut from 30 to 17 days. "That's not right," Cone said.

Cone acknowledged that NCO academies have confirmed the need for squad level leadership who can lead their men in discipline to win on the battlefield one-on-one, regardless of ISR and air support.

A profession of arms. Finally, Cone addressed a strong, new TRADOC emphasis on, 'The Profession of Arms.' He spoke of a current TRADOC campaign, which is now applying tools that provide a dialogue between Soldiers on what it means. He called it – a dream for warfighters.

"In 2003, there were those who challenged our professional knowledge and mastery of our fundamental tasks, and were reaching in with ideas to show us how to do things," Cone said. "Back then the Army was, 'pushed back on our heels a little bit.'"

In the TRADOC's Profession of Arms Campaign, Soldiers and civilians can now talk about what it means to serve in the profession, and Cone stated he believes it will result in a significant debate.

"Current thinking looks at a young Soldier graduating from (Advance Individual Training) as a professional. He's not, really," Cone said. "Time can make him or her one, or not. The campaign will put professionalism out as a discussion, with expected positive results.

"This young generation, these 'Millennials,' are looking to be a part of something. They want to be looked at as professionals," Cone said. He also resourced, "The Future of the Army Profession," by Don Snyder, which addresses the struggles of the Army in 2003 as a crucial tool in the new TRADOC campaign.

A strategy for the future. Spin-off capabilities such as unconventional warfare and improvised explosive device defeat have evolved since 2003, and have filled the gaps of what the Army couldn't do. But unless the Army takes the time to integrate their findings back into the Army structure, the Pentagon will continue to pay for outside resources to fulfill what many have said the Army can't handle, Cone said.

"The realities of full spectrum offensive and defensive operations, stability operations, wide area security, and maneuver have to be restructured," Coen said. "We've got to re-educate many. Bringing in outside trainers to fill training gaps is unacceptable. Battalion commanders must learn as part of this and continue on. We need to fold these agencies' professionals into our training system so they can be looking to the horizon of what's coming next."

Cone stated he believes the Army is big enough to find the 'A-grade talent,' needed to run the fight while the operation professionals are selected to build up the institution. "There'll be a fight in this, and I've only been to one four-star session where I saw the subject pop up," Cone said." But it's the right thing to do for our Army, and it's what will draw these two traditions of operations and training back together."

Right now, the TRADOC commander is looking for talent and experience; and is looking to bring 14 battalion commanders and four brigade commanders currently in the fight, to the schoolhouse at Fort Leavenworth, Kan., to share their knowledge.

"All of these things having to do with change in force structure are out there churning," Cone said. "We're on this quick turn right now to cut money and people, and I hope that doesn't get in the way of the serious business of developing a strategy for the future in terms of our operational concepts.

"As Iraq draws down and more dwell time exists, we've got to take the time to train, and it better be very good training, because there are competing entities back at their home station. TRADOC has a major role in this way ahead. Things are going to change tremendously in December. We should then we should have the opportunity to take these new standards of doctrine and instruction, and start getting this thing right."

General Robert W. Cone assumed duties as Commander, United States Army Training and Doctrine Command on April 29, 2011, after serving as Commander, III Corps and Fort Hood, Texas and Deputy Commanding General - Operations for U.S. Forces - Iraq. He graduated from the United States Military Academy and was commissioned as an armor officer in June 1979. He then attended the Infantry Officer Advanced Course in January 1985. In July 1985, he began studies at the University of Texas, Austin, earning a Master's Degree in Sociology and upon completion in 1987 was assigned to the Department of Behavioral Sciences and Leadership at West Point. Cone also attended the Naval War College in 1997 earning a Master's Degree in National Security and Strategic Studies.

He deployed in support of Operation Iraqi Freedom in March 2003, leading Joint Forces Command's Lessons Learned Collection Team and was subsequently assigned Director, Joint Center for Operational Analysis. In September 2004, he was assigned as Commander, National Training Center, Fort Irwin, Calif. In June 2007, Cone deployed to Afghanistan in support of Operation Enduring Freedom as Commander, Combined Security Transition Command. Upon redeployment in December 2008, he served briefly as Special Assistant, Commanding General, Training and Doctrine Command before assuming command of III Corps, in September 2009. General Cone deployed to Iraq in support of Operation Iraqi Freedom/ Operation New Dawn from March 2010 to February 2011.

An infantryman and instructor of the M16 rifle training course, Sgt. Bernardo Medina, Headquarters and Headquarters Company, 1st Battalion, 14th Infantry Regiment, 1st Advise and Assist Task Force, covers zeroing procedures and what a proper shot group should look like for Iraqi Army soldiers of Commando Company, 15th Brigade, 12th IA Division, during classroom instruction at Forward Operating Base Texan, March 20, 2011. (Photo by PFC Alyxandra McChesney, U.S. Army)

US Army modernization strategy

By Mark Norris

The president's framework to save $400 billion in security spending by 2023 will reduce projected Army base funding over the next 12 years—we won't know the details until the secretary of defense completes a fundamental review of America's missions, capabilities, our role in a changing world, and obtains the president's approval.

-Don Tison
Assistant Deputy Chief of Staff, U.S. Army G-8 (SES)

You want to cut that? Yes sir, but if we do, we'll make troop strength vulnerable for future projections on the Korean Peninsula. Yes sir, I understand, but cutting that weapon system will hollow our capabilities here and in Europe. No Sir, I'm just looking at TDA requirements that will be stripped to the bone if we don't consider this data."

This kind of conversation is going on today at the highest Army echelons as they work to develop H.R. 1540, The National Defense Authorization Act for FY 2012. Funding cuts are complicating this year's submission, leaving G-8 with the arduous task of identifying 'slash' areas to accommodate the executive branch's budget-balancing intent of cutting $400 billion from Department of Defense funding over the next 12 years. Administrators involved in current Army talks include the Office of the President; the House Armed Services Committee; Army G-8; and the Office of the Secretary of Defense.

Negotiated answers will shed light on how today's budget battles will affect future Army investment strategies and modernization. Will Army force and equipment cuts hollow instead of toughen at smaller levels? Will civilian workforce reductions harm or help the Army's mission of national defense? These are central questions in need of answers as the process plays out.

The recent 2011 budget fight that nearly de-funded the government was fought between the House of Representatives (which has a 48 seat Republican majority – 240 Republicans, 192 Democrats), and the Senate (six seat Democrat majority – 51 Democrats, 47 Republicans), two Independents who usually vote Democrat. It is Congress, not the president who is charged to raise and support armies (U.S. Constitution Article I, Section 8), but not without the addition of, "concurrence and amendments," of the Senate (Article I, Section 7). The president wields the power of veto and holds supreme U.S. government authority to sign a bill into law. However, the vice president can break any Senate tie, so more stalled negotiations could lie ahead. The House Armed Services Committee is opposed to deep cuts. If the issue lingers six months into the next fiscal year like the 2011 budget, due Oct. 31, 2010, but passed April 14, 2011, 2012 elections could change the situation. But for now, the battle rages with the first round of $400 billion military cuts targeted for this year.

When Army G-8 Assistant Deputy Chief of Staff, Don Tison, spoke at the 2011 Fires Seminar he addressed the 2011 budget battle and tried to explain how G-8 will navigate next year's budget rounds.

"I was talking yesterday with (Vice Chief of Staff), GEN (Peter W.) Chiarelli about our current Army funding situation and he asked if I'd ever seen it as confusing as it is today," Tison said in his opening address. "And, I had to tell him, I agreed that it was the most confusing I'd ever seen it because of the speed and funding cuts that have been presented to us. Things are moving so fast in so many directions, it's all oral. You listen to what a person's telling you, and you move with that."

The Deputy G-8 Chief of Staff did state the DoD finally made out good in the hard fought 2011 budget, requesting $703.3 billion, and receiving $688 billion, with the Army receiving $239 billion of its requested $245.6 billion.

"The best case outcome for the Army in regard to the $6 billion reduction from FY11," Tison said. "It provides a new start and increased production rate authorities, with long-term impacts of delayed contract awards and deferred military construction." Because of cuts made to the 2011 Army budget, we may have a little leeway to play with in next year's budget discussions, or, maybe not.

Tison repeatedly noted each year's budget round outcomes in the current political environment may have a different outcome.

In 2010, the executive administration called for a decrease of 20,000 Soldiers by 2013, to field a force of 540,000 active troops. The president then called for another force reduction of 27,000 to trim the force to 530,000 by 2017.

"Our current first round of budget battles to fund the military in 2012 will involve asking individual units what they can put on the chopping block, review their findings, and

present them to the Secretary of Defense," Tison said.

"OSD has identified 42 percent of the Department of the Army as infrastructure (support services and facilities, which fall under Title 10 [Armed Forces role in U.S.]). Since the start of the war in 2001, war forces have grown for the fight, but infrastructure has not. So if you're looking for resources to cut, forces might be an area you may want to consider," Tison said.

"I think the best that will happen is, we will be able to put a positive wedge in the process to avoid some reductions. It's much better to approach the situation from the bottom up instead of the top down, because when you start looking at whacking things from the top there's huge second pro-order effects," Tison added. "When you cut out an equipping system you impact training and sustainment, and you can't do that very well.

"What we're trying to do is look at this process to see where we can best take or not take risks. Once you turn it in there's no guarantee of what will happen. It then becomes a conversation between the Secretary of Defense and others. Taking into consideration what we need overseas, contractor and civilian reductions—and how you enact and make them stick—are all part of the oral negotiations, now under way," he said.

Current program of record capability requirement funding, for the years 2014-2018, are projecting a 15 percent equipment reduction; 15 percent full spectrum training reduction; 15 percent facilities cost reduction; and 10 percent personnel cost reduction.

OSD is also now looking at what other base realignments and closures can be done. Tison acknowledged the supplemental war funding that's been appropriated over the past eight years has been addicting. "The challenge along with everything else," he said, "is to let it 'creep back inside.'"

With a new Secretary of Defense and Army Chief of Staff recently coming on board, discussions on future Army funding are adding new dynamic to the issue of reductions for FY12.

To modernize our force, we need an investment strategy that effectively addresses today's unanswered questions, which confront the Army, and today it all depends on the budget battles waged at the top. Better and smaller are budget cut goals in Washington. But, again, what weapons systems and reduced force Soldier criteria will be required to build a smaller, yet 'better' force between now and 2023?

- White House civilian workforce reduction
- Temporary end strength increase reduction
- Army active component end strength reduction
- The global posture review (what we need where for worldwide U.S. defense)
- Implementation of DoD efficiencies initiatives
- Organizational consolidations
- Energy security investment requirements

These are more real-need questions deserving answers that could determine the outcome of the next decade. "Manpower is the Army's funding driver," Tison said. "The

SRI International's Nick Davilla, technical production manager, and Jennifer Ramirez, military after action review facilitator, track Soldier movement and actions through advanced GPS technology. (Photo by SPC Joseph Bitet, U.S. Army)

The Tactical Network Integration system in action. The network is the centerpiece of Brigade Combat Team (BCT) Modernization, providing the Soldier, at all BCT echelons, access to enhanced Intelligence, Surveillance and Reconnaissance information, continuous Situational Awareness, biometric information and greatly improved communications, while reducing tactical sustainment requirements. (Photo courtesy of Army Brigade Combat Team Modernization)

Army is essentially a labor force. None of us know today how decisions currently sought will actually work out. We've targeted some areas and have received feedback from those areas that gives us a worse case baseline."

Requirements and capabilities, changing system cost benefits that continue to meet requirements, disintegrated architecture, acquisition decision memorandum ,sourced battery units, PEO summit, defense vulnerability…this the language of our future battle management capabilities.

Fires questions will include:

"How will we get Paladin Integrated Management to milestone C by 2013?"

"How will we negotiate our needed guided multiple launch system warheads?"

"What precision Fires and Air Missile Defense firing platforms will we get?"

"How do you define space vs. aerial?"

"How will we accommodate combatant command requests for acquisition and development?

Complex is the key descriptive term describing the U.S.'s current military funding. If the $400 billion in cuts is implemented by 2023, will the force hollow, or get leaner and meaner? What may put a cut force in Jeopardy? What won't? What money will be available for research and development? If we knew this today, the mysteries would be solved, and the Army's future, one way or the other, would be known.

"It all takes you back to force structure," Tison said. "You want to have a capable force, but how do you balance? If we do get smaller, how do we get better? The challenge is all of this is happening over the summer. When you start to play with it, what makes the most sense with the reduction? These are all questions that have yet to receive answers."

Mr. Don Tison currently serves as Assistant Deputy Chief of Staff, G-8, and is responsible for U.S. Army Programs, Force Development, Quadrennial Defense Review, Army Studies Management , and the Center for Army Analysis. In this capacity, he is the principal advisor to the G-8 on key issues to include formulating plans and programs, acquiring resources, developing communication networks, executing operations, and evaluating results. In 1975, Tison received his Bachelor of Science in Business Administration from The Citadel and a Master in Business Administration (with distinction) from the Wharton School, University of Pennsylvania in 1984. He is also a graduate of the Industrial College of the Armed Forces and the Programs Managers Course at the Defense Systems Management Course. In 1997, he completed the Columbia University Senior Executive program.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Employing joint Fires

By Paul E. Jiron
Assistant Editor

COL Gary Hisle, Joint and Combined Integration Director, at Fort Sill, Okla., spoke about joint Fires at the 2011 Fires Seminar.

"I am very conscious I am addressing the body that can change the future of joint and combined Fires," Hisle said. "Joint, combined and in coalition warfare it is undoubtedly the way we will fight in the future. It is as they say 'a no brainer' that we should plan for it. Such simple truths are even more poignant at a time when our shrinking defense budgets demand the upmost efficiency in the generation and application of combat power."

Hisle then quoted former president, Dwight D. Eisenhower, who at the time was addressing Congress in 1958, and then he quoted Sir Winston Churchhill's statement to Lord Alanbrooke in 1945.

"Separate ground, sea and air warfare is gone forever. If again we should be involved in war, we will fight it in all elements, with all services as one single concentrated effort."

President, Dwight D. Eisenhower

"There is at least one thing worse than fighting with allies – And that is to fight without them."

Sir Winston Churchill

"One might have thought then that the lessons learned process over the past 50 or 60 years meant that joint and combined operations were now seamless," Hisle said.

He then posed the following question to the audience, "If we are always playing in an away game – shouldn't we train and fight as a joint and combined team?"

In 2004 and 2005, MG David P. Valcourt, Fort Sill's commanding general, had the vision to tackle joint and combined warfighting by standing up the Joint and Combined Integration Directorate with then COL(P) David D. Halverson as its first director, Hisle said. This directorate established memorandums of agreement to train joint and combined Fires with our Soldiers, sailors, airmen, Marines and coalition partners. In 2011, we have continued this effort; 'One Team – One Fight.'

Hisle then focused on three areas, first on our joint and combined efforts, second on our joint Fires initiatives here at the Fires Center of Excellence, and lastly on what is being done now, to set the conditions for the way ahead in the combined arms maneuver and wide area security fight as described by the current chief of staff, GEN Martin E. Dempsey.

Current and future operating environments. Hisle went on to tell what we all know as the Jessica Lynch story. He told how a captain in the U.S.

Soldiers from the U.S. Army Florida National Guard's 3rd Battalion, 116th Field Artillery Regiment, secure their track vehicles to a railroad car for an upcoming annual training at Fort Stewart, Ga. to certify on the M270 Multiple Launch Rocket System. (Photo by SSG Blair Heusdens, U.S. Army)

Army - following only the digital needle on his commercial GPS and a 1:100,000 theatre scale map, unbeknownst to him, he proceeded to navigate the 507th Maintenance Company straight into a series of deliberate, Fedayeen ambushes within the city of An Nasiriyah. He had inadvertently placed his Soldiers at the tip of the allied thrust into Iraq – a full 12 hours ahead of the main U.S. Marine Corps armored offensive. In a little over 60 minutes, 11 of the 33 Soldiers in his 18-vehicle convoy were dead, seven were captured and nine were wounded; only six men and three vehicles escaped. Another 16 U.S. Marines were killed in the subsequent counter-attack battle, and the abduction and plight of a 19-year-old female Soldier from Palestine, West Virginia - Jessica Lynch - was broadcast across the world.

The spokesman for U.S. Central Command, in Doha, commented, "As far as the incident concerning the convoy, I believe that it is probable, like many other tragic incidents in war, that a young officer, leading his convoy, made a wrong turn and went somewhere where he wasn't supposed to. There weren't combat forces around where it happened."

Hisle stated if and when, in the future, when we fight a suppressive, kinetic-combined arms, armored battle; in and around that battle in time and space, we will also be fighting a precise, integrated, multispectral, multi agency, highly-focused battle where all our effects will be open and transparent to the full and immediate effect of a networked media industry.

The demands and constraints of the operating environment require agility and adaptability, he added. At the same time we are on the cusp of a revolution; the upsweep of an exponential curve in our ability to fight a precision battle. Hisle said the corps and combined air operations center will no longer be able to cope with the volume in a timely manner. He also explained how it is not acceptable to go up five chains of command and then down five chains of command to get a HIMARS across a brigade boundary just because those brigades are from different nations in the coalition.

"Those skill sets which have been thought rare and special and the stuff of darkened rooms and special forces need to be pushed down to accessible tactical levels," Hisle said. "Proliferated, normalized, demystified and institutionalized. This is the future of Fires. In doing this we will need to examine our authorities, give clear guidance to lower levels of command and carry some risk. To mitigate risk we must get the training and education of our Fires commanders exactly right."

A Soldier with A Battery, 1st Battalion, 84th Field Artillery Regiment, 170th Infantry Brigade Combat Team scans a nearby ridge during a lunch break with Afghan uniformed policemen in the borderlands of Qeysar and Ghormach, Afghanistan. (Photo by PFC Nathan Goodall, U.S. Army)

Joint and coalition interoperability. Next, Hisle talked about joint and coalition interoperability. He said we must focus our doctrine, training, and technology to enhance and not detract from joint and coalition interoperability.

Our Army-Navy, Army-Air Force warfighter talks, JCAS symposiums, Joint Fire Support Executive Steering Committee, and coalition discussions, all must drive us to be more interoperable and synchronized and less stove piped and parochial in the way we train and fight, Hisle said.

He added that integrating Army joint and multinational lethal and nonlethal capabilities is essential to operationally adaptive Fires. We must have the ability to identify, locate, target, and engage threats across the joint and coalition force, and that joint and coalition Fires— by design —must be the right mix of precision, near-precision and area Fires, along with having scalable lethality that achieves discrete effects as METT-TC dictates.

Hisle noted in 2011 the U.S. is fighting as a combined force in Afghanistan. He said it is not perfect, but we are leveraging each other's strengths to make it better. There are some challenges that will be addressed through the initiatives we are working on here at the Fires Center of Excellence that pertain to joint and combined Fires.

Hisle talked about an incident that happened in 2009, at Combat Outpost Keating, Afghanistan. It was the use of joint Fires that enabled U.S. forces to repel the enemy attack in this engagement. The following is the executive summary, AR 15-6 Investigation, on 3 Oct. 3, 2009, Soldiers of Bravo Troop, 3rd Squadron, 61st Cavalry, repelled an enemy force of 300 anti-Afghan forces fighters, preserving their combat outpost and killing approximately 150 of the enemy fighters. U.S. forces sustained eight killed in action and 22 wounded, all but three of whom returned to duty after the attack. The Soldiers distinguished themselves with gallantry, courage, and bravery under the heavy enemy fire that surrounded them.

Early on Oct. 3, 2009, the Soldiers of B Troop awoke to a previously unseen volume of enemy fire, commencing at approximately (5:58 a.m.), and coming from the high ground

surrounding the COP. A simultaneous enemy attack against OP Fritsche limited mortar fire support from that location. Enemy fighters applied the information gathered from probing attacks and immediately inflicted casualties on the COP's guard force and suppressed COP Keating's primary means of fire support, its 60mm and 2 120mm mortars. Afghan National Army soldiers on the eastern side of the compound failed to hold their position, and enemy Taliban fighters penetrated the COP Keating perimeter at three locations.

Continuing to fight under the heavy enemy indirect and direct fire from superior tactical positions, and suffering a loss of power to the tactical operations center when enemy forces destroyed the main power generator, B Troop withdrew to a tight internal perimeter. With critical supporting Fires from U.S. Air Force close air support and Army AH-64 Apache helicopter close combat aviation Fires, the junior officers and NCOs regained the initiative and fought back during the afternoon hours to regain control of COP Keating. The Soldiers, aided now by continuous Fires from supporting aviation units, engaged the enemy fighters who had breached the compound, killing at least four of them, and reestablished control of key buildings. B Troop and the air support neutralized Taliban positions in the local Afghan National Police station and mosque in the nearby village of Urmol, as well as in the surrounding hills.

Targeting and education. Hisle went on to discuss the importance of targeting and education among the ranks. He said targeting was not a 'joint' effort, but as a whole there are efforts underway to make it a more 'joint' process.

He went on to explain the importance of senior leaders' education in coalition forces, particularly those General Officer/Flag Officer that will hold Target Engagement Authorities. "We also are continuing to improve our education and training in the areas of electronic warfare, Special Technical Operations, Precision Fires, Joint Fires Observers and the Joint Operational Fires and Effects Course," he said.

Joint Fires observers. Next Hisle turned his attention to Joint Fires Observers. He said JFOs are our future observers, and in order to stay relevant this job must have the credibility and recognition of the joint and combined team. Establishing common standard for JFOs in turn will breed confidence. There are many allied and coalition forces committed to JFO. Currently, there is a JFO memorandum of agreement:

- The U.S. Army, U.S. Marine Corps, U.S. Air Force, U.S. Navy, SOCOM, Austria and Hungary are all signatories to the JFO MOA.
- New Zealand and Slovenia have committed to sign the JFO MOA.
- Canada and Germany are in detailed discussion to sign the JFO MOA.
- Brazil, Chile, Denmark, France, Nederland, Pakistan, Poland, Romania, South Korea, Spain and Sweden have all expressed interest in JFO.

The JFO Course and training remains a priority at Fort Sill, Okla. Hisle said.

- The current number of seats available at Fort Sill per year is 1032 (planned is 1080 in 2012).
- The JFO Course has a graduation rate of 79 percent.
- TRADOC estimates a 33 percent attrition rate per year, which is a high turnover.

Hisle said some of the challenges of JFO are sustaining and equipping them within the operating force. He said development does not stop at the JFO school house gate. JFO is part of a system that needs to be trained within the force. He also noted that experience levels among Fires officers, the demand of operations, training time and a lack of awareness with maneuver commanders are all substantive challenges which are currently being addressed. Possible solutions to some of these pressing problems are:

- Education ….Basic Officer Leaders Course-FA Branch Students trained as JFOs in FY12 at Fort Sill, Okla., Briefings at Maneuver Center of Excellence at Fort Benning, Ga. Pre Command Courses, Captain Career Courses and BOLC.
- Center for Army Lessons Learned - Operation Enduring Freedom lessons learned briefings to General Officer Steering Committee and General Petraeus
- Sustainment standard operating procedures to brigade combat teams
- JFO conference and briefings at Joint Forces Command Symposiums

If the environment is unpredictable we need to enable our people to make decisions rather than follow drills. He who thrives in chaos wins in chaos.

Precision Fires. Precision was the next topic of discussion. Hisle said there is absolutely no doubt that this is a growth industry. Using Personal Forward Entry Devices and Precision Strike Suite for special operations forces, observers can now define the absolute coordinates of a target within a few minutes. Coordinate seeking precision guided munitions are rapidly available from air and ground. Yet with all this technology available to us, Combined Joint Task Force 101, with an area of responsibility that is complex and constrained, had a dumb vs. precision bomb ratio of 3,700:1 in their first six months in theatre, Hisle said.

There are current plans that include education, authorization, accessibility and ownership to correct this. "We are training and educating Fires NCO's in the three precision targeting pillars which are target mensuration, collateral damage estimation and weaponeering," he said. He went on to add that "we have institutionalized this here at the Fires Center of Excellence."

Joint air ground integration cell. Time and time again the need to better synchronize air and ground operations has been demonstrated, Hisle said. The joint air ground integration cell can give Fires forces the opportunity with the establishment of a division level construct to integrate joint air and ground operations. A construct that adds an air support operations cell from the Air Force at the division, enabling integrated and synchronized planning and execution of air space and joint Fires.

Between FY 12 and FY 15, the Air Force will stand up 13 ASOCs at Army installations across the globe aligning one for each active Army division. This concept has been tested at the Joint Entry Force Expeditionary Warfighting Experiment, at Austere Challenge 11, and it will be a part of Ulchi Focus Guardian and 2ID Warfighter later this year. The next step is to work it into a FORSCOM division level exercise sometime in FY 12.

Joint talks. We are actively involved in multi echelon talks to further our cause, Hisle said. One venue is through the Joint Fires Support Executive Steering Committee in which MG Halverson represents the Army to the Joint Staff. Other venues include the Army - Air Force warfighter talks, the Army - Navy warfighter talks, America, Britain, Canada, and Australia NATO Symposiums, and Joint Close Air Support Symposiums

along with other venues to further our efforts to synchronize and integrate Fires.

The way ahead.

"I think the challenge for us all is to understand that in a competitive security environment, institutional adaptation is an imperative—and we have to be ready to run faster than our competitors to stay ahead."

GEN Martin E. Dempsey, CSA

Before opening up for questions from the audience, Hisle wrapped up his briefing by stating the Fires force battlefield is rapidly changing and there's work to be done to hone every aspect of Fires skill sets that troops will require.

"We need to adjust a mind set to keep pace - so we must start with education," Hisle said. "We are asking a great deal of our people to manage this complexity thus we have a responsibility to train them." This education must be held throughout a Fires professional's career. Currently the schoolhouse is working to incorporate basic skills in the joint and precision fields, he said.

"If the environment is unpredictable we need to enable our people to make decisions rather than follow drills," he added. "He who thrives in chaos wins in chaos."

Hisle then followed up this comment with an example.

"When you do your annual personal weapons test, rifle or pistol, what does it comprise?" he asked. The target appears and then target falls when hit. Every time a Soldier pulls the trigger they have to make a potentially complex decision.

"The training for that decision must start at the very beginning," he explained. "Once we have mastered stripping, assembling, and zeroing – every kinetic aspect of our training must involve a decision. We need to escalate that simple scenario into the world of joint Fires. We need to put that metaphorical woman holding a baby into our sights.

"There is no point having an observer that is not part of the system that deals with CAS. That should be his normal career progression," Hisle explained. "We need to recognize our observers as part of a system."

JTAC, FSO, JFO must work and train together as a team routinely, and they must have qualified professional oversight in order to be guided, sustained and developed. In order to achieve these goals the Fires force structure must be adjusted.

"We need to look at our HQs to ensure the Fires advice and the technical management of battle space we are providing to our commanders is good enough," Hisle said. "We need to develop jointly and as a coalition. We must have common standards. Most importantly we need to make these changes now. "Our people may be special, skilled and committed but this skill set is no longer special – it is, quite simply, what Fires guys do," Hisle concluded. "We need to ensure we are balanced to do it. We have some mechanisms in place. We have the Joint Fire Support Executive Steering Committee, ABCA, NATO and several bilateral agreements but, coalitions of the willing are often pedestrian and bureaucratic.

American, Romanian, Macedonian, and Ukrainian soldiers discuss operations during Combined Endeavor 2010 on Sept. 1. Combined Endeavor is the world's largest communications interoperability exercise, preparing international forces' command, control, communications and computer systems for multinational operations. (Photo by Staff Sgt. Ali E. Flisek, U.S. Air Force)

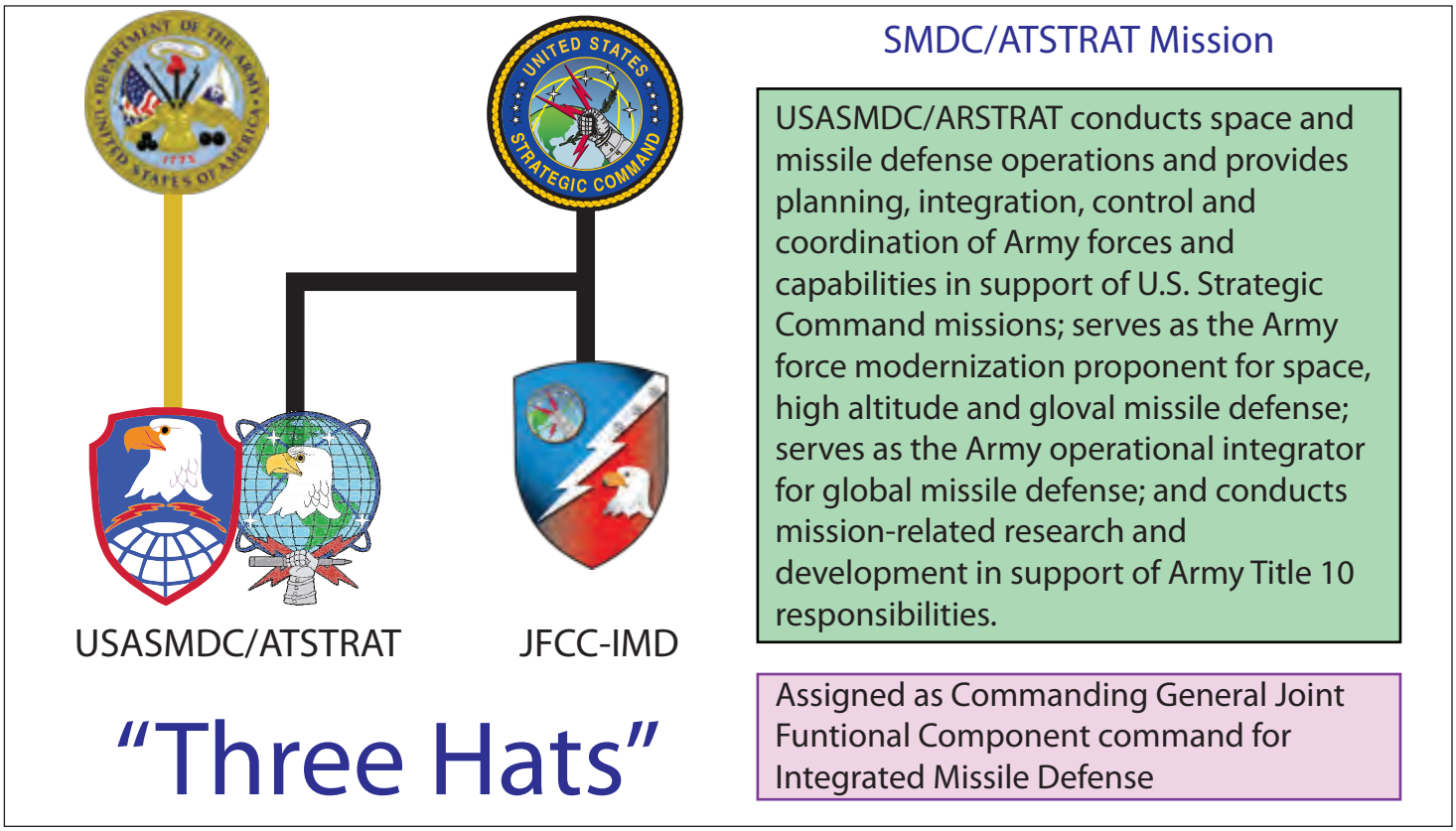

Figure 1: Space and Missile Defense Command /Army Forces Strategic Command and Joint Functional Component Command-Integrated Missile Defense mission. (Photo Illustration by Rick Paape, Jr., Fires Art Director)

Space and missile defense for the warfighter

By Sharon McBride
Editor-in-Chief

LTG Richard P. Formica, commander of the U.S. Army Space and Missile Defense Command/Army Forces Strategic Command and Joint Functional Component Command-Integrated Missile Defense, was on hand, May 18, at the 2011 Fires Seminar to discuss, "Space & Missile Defense for the Warfighter."

USASMDC/ARSTRAT is one command, split-based, multi-component organization that conducts space and missile defense operations and provides planning, integration, control and coordination of Army forces and capabilities in support of U.S. Strategic Command missions. It also serves as the Army force modernization proponent for space, high altitude and global missile defense, as well as serving as the Army operational integrator for global missile defense; and finally, it conducts mission-related research and development in support of Army Title 10 responsibilities.

USASMDC is located at Redstone Arsenal in Huntsville, Ala., while ARSTRAT is located at Peterson Air Force Base in Colorado Springs, Colo. USASMDC/ARSTRAT provides three core tasks, Formica said. These include providing trained and ready space and missile defense forces and capabilities to the combatant commands and to the Warfighter, building future space and missile defense forces, and researching, testing, and integrating space, missile defense, directed energy, and related technologies.

Formica also explained that USAMDC/ARSTRAT provides more than 830 Soldiers and civilians in support of ballistic missile defense and space operations, and while functioning as an Army Force Generation force, during deployments to the U.S. Central Command region, it often supplies six-man teams on a rotational basis.

His command also supplies teams for homeland security, by providing missile defense crews, 24-hours-a-day, seven-days-a-week, 365-days- a-year, in order to protect 300 million Americans.

USAMDC/ARSTRAT also operates U.S. Army Kwajalein Atoll, Formica said. USAKA, while not well-known to most, is home to the Reagan Test Site, which is located in the Republic of the Marshall Islands. This remote site is 2,100 nautical miles southwest of Honolulu, Hawaii. Kwajalein is the world's largest coral atoll surrounding the world's largest lagoon. Eleven of the 100 islands comprising the Kwajalein Atoll are leased by the United States from the RMI government. Radar, optics, telemetry, and communications equipment on eight islands provide instrumentation for ballistic missile and missile interceptor testing and space operations support.

Formica also painted his command as an uniquely organized and geographically well-positioned command , which provides doctrine, organization, training, materiel, leadership and education, personnel, and facilities analysis and solutions, operates a TRADOC certified Institute of Excellence,

and conducts tactical space protection studies in support of Army G3/5/7.

Formica went on to explain this uniqueness, by clarifying how the Army Forces Strategic Command and Joint Functional Component Command-Integrated Missile Defense is a joint, diverse, global reaching component command responsible to USSTRATCOM for synchronizing warfighter missile defense priorities across ground component commands. USSTRATCOM/JFCC-IMD's role is to synchronize operational global missile defense planning, as well as the joint functional manager for missile defense. Additional roles include coordination and management of global assets for missile defense, and providing alternate support for missile defense execution.

"It's one command with very diverse partners," Formica said. STRATCOM HQ, JFCCs, MDA, joint staff, GCCs, JFCOM, other military services, and over 12 nations make up USSTRATCOM/JFCC-IMD.

Formica went on to further explain how ballistic missile defense falls under this unique command's umbrella. BMD has six priorities, Formica said. These include defending the homeland against limited ballistic missile attack, defending against regional threats to U.S. forces, allies, partners, deploying new systems only after their effectiveness and reliability have been determined through testing under realistic conditions, developing new capabilities that are fiscally sustainable over the long term, developing flexible capabilities that can adapt as threats change, and finally, expanding international cooperation.

Formica stated that although his command has numerous capabilities under development; the current trend is leaning toward integrated air and missile defense. Terminal high altitude area defense, as well as other air defense systems, will be able to support both programs and will allow for multiple missions.

THAAD is currently designed to shoot down short, medium, and intermediate ballistic missiles in their terminal phase using a hit-to-kill approach. The missile carries no warhead but relies on the kinetic energy of the impact. THAAD was designed to hit Scuds and similar weapons, but also has a limited capability against ICBMs.

Formica concluded by explaining that his command draws funds from several resources; some are funded directly by the Department of the Army. Seventy percent of his civilian workforce is funded by the Department of Defense, while the other 30 percent is funded by the reimbursable notes from the DOD.

Funding also comes from the customers who benefit from some defense programs AMDC provides as well as through other studies.

Lieutenant General Richard P. Formica previously served as a special assistant to the Chief of Staff, U.S. Army, Washington D.C. His previous assignments include Commanding General, Combined Security Transition Command-Afghanistan, Operation Enduring Freedom, Afghanistan; Director of Force Management, Office of the Deputy Chief of Staff, G-3/5/7, HQ, U.S. Army; Joint Fires and Effects Coordinator and Commanding General, Force Field Artillery Headquarters, Multi-National Corps Iraq and III Corps, Operation Iraqi Freedom, Iraq; and III Corps Artillery, Fort Sill, Okla.

LTG Formica was commissioned in 1977 upon completion of the Reserve Officer Training Corps Program at Providence College, Providence, R.I., and graduated from Bryant College in Smithfield, R.I. He is a graduate of the Field Artillery Officer Basic and Advance Courses, the United States Army Command and General Staff College, and the National War College, where he earned a degree in National Security and Strategy.

SGT Russell Smith, a communications operator in the U.S. Army Alaska Army National Guard's 49th Missile Defense Battalion, monitors a simulated exercise.
(Photo by Fred W. Baker III, Department of Defense)

Saving lives and protecting critical assets:

Counter-Rocket, Artillery, and Mortar provides safety in an era of uncertainty

By LTC Michael Morrissey, CPT Shannon Billig, and SGM Brian Damron

> "...we will be engaged in an era of persistent conflict for some time to come. What that means, that in that era, we expect that these conflicts will arrive unpredictably. They will vary in intensity and scope. They will be less susceptible to traditional means of conflict resolution. As a result, even with the draw down in Iraq, and eventually in Afghanistan, our operating environment in the next decade is going to remain uncertain and complex and our commitments are likely to be frequent and continuous. So that's the environment that we're preparing ourselves for."
>
> -GEN George Casey, Chief of Staff of the United States Army

C-RAM encompasses a host of systems, many of which were already in use along with selected commercial off the shelf technology. It is employed to sense, warn, and intercept incoming enemy artillery, rockets and mortar rounds intended to kill friendly forces and damage critical equipment. Currently, forward area air defense, Air and Missile Defense Workstation, Wireless Audio Visual Emergency Systems, lightweight counter-mortar radar, and of course, Land-based Phalanx Weapon System compose the System of Systems organic to C-RAM. In support of the sense function, C-RAM leverages Fires systems such as the Q36, Q37 Firefinder radars, and the Q48 LCMR. Taken together with Soldiers, sailors, and civilians, they comprise an effective Fires system to protect friendly forces from enemy indirect fire attacks.

As experienced in Iraq for the last seven years, enemy indirect fire is a dangerous portion of the operational environment. Despite significant improvements across the Iraqi theater of operations and formation of the Iraqi government, indirect fire continues to threaten U.S. forces. Various insurgent groups bent on disrupting progress use indirect fire as a weapon of choice along with improvised explosive devices. Currently, friendly forces bear 10-15 indirect fire attacks per week on average, the majority of which are multiple round attacks consisting of 60 mm mortars to 122 mm rockets.

Although indirect fire is significantly down from surge period attacks, it is still menacing. With the transition from Operation Iraqi Freedom to Operation New Dawn, indirect fire remains a logical choice for insurgent groups as it will in future conflicts. Regardless of accuracy, a casualty producing rocket attack against the international zone, seat of the Iraqi government and location of the U.S. Embassy, gains media attention bolstering insurgent propaganda. In order to protect friendly forces against the indirect fire threat tactic, Counter-Rocket, Artillery, and Mortar is in its sixth year of operation.

Joint Task Force 5-5, composed of Soldiers, sailors, and civilians, recently completed a C-RAM mission in support of Operation Iraqi Freedom and Operation New Dawn. The unit was an evolution of the counter indirect fire mission and benefitted from previous lessons learned. In order to continue that legacy, Task Force 5-5 aggressively improved their 'foxhole' and further developed counter indirect fire operations in support of United States Forces - Iraq, ultimately enhancing the level of force protection against a persistent, adaptive enemy. The task force provided more than 589 successful warnings and 24 intercepts against enemy indirect fire attacks ranging from rudimentary to complex; and single to multiple round attacks composed of up to 33 rockets. As part of the follow on unit's preparation, Task Force 5-5 deliberately captured and shared lessons learned for application by a capable 1-174th, Ohio Army National Guard. In the following paragraphs, unclassified techniques and procedures are highlighted as employed against a tireless threat that demonstrated notable complexity and audacity.

Pattern analysis and intelligence fusion. As part of the counter indirect fire fight, intelligence operations played a critical role in support of disrupting the enemy's ability to launch successful indirect fire attacks through predictive and pattern analysis. The indirect fire threat was multi-faceted and unique to each region, province, and city in Iraq. Each C-RAM equipped base faced distinct threat capabilities and techniques. Defense designs and counter indirect fire measures were tailored to the specific threat surrounding each base. In conjunction with the supported unit, pattern and trend analysis was conducted specific to each location to determine threat characteristics. Point of origin and points of impact were shaped by surrounding terrain, support of local populace, munitions type, and counter indirect fire operations. When integrated into their supported maneuver unit, task force down to section, C-RAM units assisted by identifying patterns such as threat windows, launch techniques, and identifying named areas of interest. A pattern analysis wheel was a useful tool for determining attack clusters and emerging trends. Analysis included potential points of origin, supply avenues and networks, munitions characteristics, initiator type, propellant, and even forensics exploitation of the point of origin site.

The task force maintained a detailed database that was used extensively to identify trends and help shape the counter indirect fire. Thorough pattern analysis included identifying cultural and environment impacts to indirect fire activity. For example, the threat may perceive severe weather limits friendly surveillance assets, and seek to establish firing positions during limited visibility. Proactive measures were taken to counter this activity. Task force intelligence operations were nested with United States Forces-Iraq level intelligence and took a broader view across the Iraqi joint operational area looking for regional patterns not just in time, but space.

This analysis was provided to batteries to further help supported units identify patterns. During certain months, flooding displaced insurgents from historical point of origin locations and units saw new attack points of origin. For example, analysis of rocket rail construction and elevation was useful for piecing together trends and explaining friendly sensor performance. Cultural observances had a distinct impact on enemy indirect fire attacks. During Ramadan or Ashura, indirect fire activity against friendly forces dropped significantly, but historically increased during Christian holidays. The sharing of this information was extremely vital in understanding a diverse threat which spanned across unit boundaries. For the C-RAM task force, the priority of collection was indirect fire. However, multiple agencies and units such as Task Force Troy and division intelligence sections conducted analysis on certain aspects of enemy indirect fire that taken together contributed to a clearer threat picture. It was also essential the Task Force 5-5 was synchronized with adjacent units and higher headquarters intelligence efforts and assessments. This was done in a variety of ways including battlefield circulation by task force leadership, counting the intelligence officer. To be effective, 5-5's intelligence products were tied to the overall threat activity. It was of little use to analyze enemy indirect fire activity in a vacuum separate from other forms of contact such as improvised explosive devices and small arms fire.

Indirect fire attack analysis. Comprehensive, deliberate forensics was conducted for each enemy indirect fire attack against a C-RAM equipped base. Attacks were analyzed to determine sensor defense design performance, attack characteristics (round trajectory, altitude, and speed), threat techniques, and crew proficiency. Sensor capabilities were assessed to ensure limitations were minimized. Warning time was reviewed along with data for intercept equipped bases. The analysis included assessments from the supported units and was routinely reviewed by USF-I leadership. Taken together, determination was made what, if any improvements or modifications were needed. Task Force 5-5 also supported crater analysis at various locations to examine points of impact produced by enemy indirect fire. This further contributed to indirect fire attack analysis with important information such as azimuth of fire and type of munitions;

The Counter Rocket, Artillery, and Mortar System is an initiative taken in response to an operational needs statement made by the Multinational Force Iraq. The directive arose in response to the increasing number of casualties caused by attacks using rockets, artillery, and mortars in Iraq. The land-based Phalanx B was subsequently deployed in Iraq in the summer of 2005. It protects the Green Zone and Camp Victory in Baghdad, Logistics Support Area Anacondain in Balad, Iraq. (Photo courtesy of 5th Battalion, 5th Air Defense Artillery Regiment)

especially helpful when attacks defeated sensor coverage and track data was limited. In a few cases, there were attacks that could not be explained.

In those cases, the task force packaged available data and sent it to the C-RAM program manager in Huntsville, Ala. A team of analysts then examined the data and provided findings. This reach back capability was especially helpful in the beginning when 5-5 first assumed their mission. Analysis was then archived by the task force for future use in support of historical attack pattern development, intelligence analysis, and refinement of warning techniques.

Manual warn technique. C-RAM is designed to 'auto-warn' for an impending indirect fire attack based on separate acquiring and confirming radars. Because of a myriad of factors such as complexity of attacks, munitions types, and sensor limitations, the majority of time there is no confirming radar. Without confirmation, the man in the loop, the trained forward area air defense operator, makes a split second assessment to determine if the track is hostile. If hostile, the operator engaged the warning system by hand, manually warning personnel in the vicinity of impact. Otherwise, the incoming round impacted without warning, possibly killing or injuring friendly personnel. This was called a 'no warn' and it was a significant emotional event.

For a variety of factors, this entire process was not simple. Depending on base location, a forward area air defense operator may delete hundreds of tracks/sensor acquisitions throughout the day, resulting from causes such as aircraft or small arms fire.

In order to simplify the process and assist operators discriminate threat from the benign, the task force developed, tested, and implemented manual warn techniques. Operators were trained to manually warn if the track met the following criteria: matched velocity and altitude of known mortars/rockets, point of impact was within close proximity to the base, originated from a named area of interest or were multiple tracks originating from same point of origin. An added discriminator included if the attack occurred during a historical indirect fire threat window specific to that base. Several areas included additional measures to distinguish threat from insignificant based on enemy, terrain, civil activity.

After implementation of this technique, the warn rate significantly increased. There was also a human component. Operator confidence grew and self-imposed stress reduced since leadership underwrote the small number of false warns resulting from operator judgment. Task Force 5-5 Soldiers and sailors took the mission very seriously striving to reduce any margin of error; not providing early warning for an indirect fire attack was personal. Because of their focus and significant attention given to defense design by USF-I leadership, the indirect fire warn rate improved 13 percent from February 2010 to February 2011.

Sensor defense design. A common misunderstanding was that sensor defense design is a passive activity. Once established, there was no requirement to reassess or modify. Reality indicated differently. The operational environment was constantly changing. With the flow of deploying and redeploying units, radar locations and system changes occurred.

In addition, environmental conditions required changes in Firefinder orientation such as the rainy season causing flooding of historical point of origins and pushing threat to new locations. In conjunction with supported units and USF-I, a system was developed to routinely reassess base defense designs and ensure they were valid in an ever-changing environment.

Monthly USF-I joint Fires sensor working groups were conducted to review sensor design theater-wide to ensure optimum radar positioning, maximizing capabilities specific to the forward operating base, and minimizing sensor limitations.

To ensure sensor defense designs would not be degraded due to interference, leaders also worked with unit electronic warfare officers. When a system became degraded or inoperable, USF-I and the task force aggressively pursued actions until it was fixed. A sense of urgency was imperative and often required priority of movement by aircraft. Tied to accurate reporting and depending on the defended asset, sensors were moved to cover critical assets during specific operations.

Fires integration. The counter indirect fire mission was a clear example of Fires integration. Coordination routinely occurred at each level of USF-I to effectively counter the threat. The USF-I deputy fire support coordination officer and the Task Force 5-5 commander talked daily to ensure coordination and synchronization of efforts. Routine USF-I sensor manager meetings also enabled leaders to assess radar positioning. In addition to managing sensors and analyzing indirect fire attacks, Task Force 5-5 included a target acquisition battery, B/2-5. Deployed independently from Fort Sill, B/2-5 provided theater-level radar coverage across 16 locations in support of the counter indirect fire fight. This task organization facilitated coordination, reporting, and further established the task force as a Fires unit.

Interagency and joint operations. As part of Operation New Dawn and in support of USF-I, the task force coordinated and

Below, left to right (back row) SGT Javier Saucedo, SPC Joseph Frank, SGT Jose Zarate, SPC Daniel Coons, SPC Christopher Byrd, and SPC Clifford Echaluse. Front row, SSG Karl Jones and 1LT Levi Pippy, members of Joint Task Force 5-5, take a moment in Hawjah, Iraq. (Photo courtesy of 5th Battalion, 5th Air Defense Artillery Regiment)

established sense and warn operations inside the U.S. Embassy tactical operations center. This required comprehensive planning and coordination with the Department of State security team. From the beginning, crosstalk enabled the movement of sense and warn operations from the rear area operations center to inside the embassy. The operation began with an understanding of terms and clearly defined roles and responsibilities such as reporting channels. Communication exercises were deliberately conducted to ensure sense and warn was operational, both primary and back up. As a result of professionalism on both sides, a relationship was established that ultimately contributed to embassy protection.

Another example of interagency operations was the Assassins, Alpha Battery, 5th Battlion, 5th Air Defense Artillery, protection of the Basrah provincial reconstruction team and coordination required to ensure mission success. In addition to interagency, the task force supported joint operations. The Bushwhacker Battery, B/5-5, was under tactical control of the 332nd Air Expeditionary Wing on Joint Base Balad. It provided counter indirect fire to the largest, most heavily indirect fire attacked base in Iraq and coordinated daily with 332nd leadership. The Hellraiser Battery, Headquarters and Headquarters Battery, 5-5 ADA, reorganized as a joint intercept unit, routinely synchronized operations with joint units located on Victory Base Complex to sort through the complexity of being near Baghdad. Finally, noncommissioned officers from B/2-5, the Bulls, supported USF-I establishment of the first Iraqi Q-36 and Q48 academy.

Command and control. Task Force 5-5 was operational control to United States Force-Iraq. As a separate task force, C-RAM received direction from USF-I, reported to USF-I through the J33, and worked in tandem with the joint Fires cell. Prior to Task Force 5-5, there was a theater lead, a TRADOC representative who interfaced and was the link between the C-RAM unit and USF-I. Although this structure clearly worked, unity of command improved. During 5-5's deployment, the task force maintained an aggressive liaison officer within the USF-I headquarters and leveraged both the air and missile defense chief and the fire support coordination officer to support counter indirect fire operations. This required coordination and teamwork, but command channels were clear.

Within the task force, batteries were under tactical control of their supported units and reported to the task force on all matters through formal and informal channels to include bi-weekly teleconferences. Further breakdown included sense and warn sections under tactical control integrated within their supported brigade or battalion operating inside operation centers to facilitate coordination, reporting, battle drills, and situational awareness.

Crew operations. Crews were built, trained, and stabilized no different than a Paladin or PATRIOT crew. Given the vigilance required and lessons learned, crew operations didn't exceed eight hour shifts. Twelve hour shifts in front of the forward area air defense screen was the exception and for short duration only. In addition, leadership developed methods to rotate Soldiers for life support activities. Eating while on shift was discouraged given the split second decisions that were required. After Soldiers and sailors returned from rest and relaxation, leaders ensured they were acclimated first and received refresher training, and did not simply place them right back on shift. During historical indirect fire threat windows, leaders reinforced crew manning.

Leader presence was not intended to micromanage operators, but provided additional emphasis on standards and top-cover for the numerous requests for information that occurred immediately following an indirect fire attack. If a crew was moved to a new area, they were trained to the specific threat in that location down to ballistic characteristics of historic threat munitions. The task force utilized the operations sergeant major to certify crew changes. Movement of crews sometimes occurred as a result of new defense priorities or to reinforce a unit for a specific operation. Professional non-commissioned officers were the key to maintaining proficiency, standards, and discipline.

"I have witnessed firsthand that when everyone else is taking refuge; A/5-5 Soldiers, like SPC Kandice Phillips, are standing tall, shouting grid coordinates, plotting points of origin and points of impact. This may look like chaos to the untrained observer, but after a few seconds, watching this carefully orchestrated dance under the careful eyes of leaders like SSG Joshua Medina, I can't help but be impressed by the tenacity and dedication," said 1SG Jason Fitzpatrick, Headquarters Support Company, 1st Infantry Division, Fort Riley, Kan.

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Full spectrum operations. Prior to receiving the directed counter-rocket, artillery, and mortar mission, the task force executed a comprehensive Avenger/Stinger training plan that included platoon evaluation exercises, table certification, and live fire. Although not intentional at the time, that training later became useful and reinforced the doctrine of full spectrum operations. After approximately four months in theater and simultaneous to conducting the mission, 5-5 also planned and prepared to execute a Stinger ground-based air defense mission to protect critical assets. During planning, the task force liaison officer located with the USF-I future operation team to facilitate planning coordination while commanders conducted reconnaissance of proposed Stinger positions. Engagement authority and kill chain procedures were developed and rehearsed with guidance from the USF-I J33. Noncommissioned officers conducted individual and collective training plus verified pre-combat checks. Batteries used internal master gunners to conduct certification. Ultimately, the enduring mission was built on a response plan tied to intelligence.

Lessons learned were shared with 1-174th to ensure they deployed certified for the contingency plan. In support of stability operations, the task force conducted test fires around Muslim religious holidays and prayer times. Further considerations were given depending on the local operating environment.

Sustaining momentum and fighting complacency. During deployments, leaders face the challenge of fighting complacency and maintaining vigilance. This was certainly the case for Soldiers who spent their shifts focused on a screen or alert within an engagement operations center for extended periods. The task force used a variety of methods; a few of them are highlighted here. First, the Soldiers and sailors thoroughly understood their

purpose supporting the overall mission; they understood their vigilance protected friendly forces and complacency could literally allow friendly forces to be killed. This was reinforced during extensive battlefield circulation by all echelons of leaders. Task force letters were sent to family members emphasizing the incredible mission their loved one served. Soldiers took the mission to heart, and strove to prevent no warns attributed to complacency. Second, at the platoon and battery level, units implemented creative methods to mix up the mission so Soldiers received time off as well as being recognized for excellence.

In addition, the task force provided incentives. Outstanding crews were highlighted in the task force newsletter or other public affairs venues. Sections with the best warn rate in each division area were awarded with tangible encouragement such as unit fleeces or impact awards. When crews performed well, task force leadership contacted them directly to thank them. Unit leaders provided VIP orientations of operations to proudly demonstrate Soldier discipline and proficiency. This too helped crews stay sharp by breaking perceived monotony and hearing USF-I and 31st ADA Brigade leadership laud their efforts.

Conversely, for those few times when an after action review indicated complacency or poor discipline, the task force commander directed an investigation. If the investigation confirmed there was a lack of discipline, punishment or retraining was employed. These techniques not only enabled the task force to successfully accomplish the mission, but also avoid nonsense associated with a lack of discipline.

Maintenance operations. As program proponent, the U.S. Navy controls the parts procurement process for the land based Phalanx weapon system. The Navy life cycle sustainment support process is structured for Phalanx guns mounted on ships. The radically different environment encountered in Iraq caused parts failures that were not readily replaceable in the Navy because of usage history. Some initial modifications intended to adapt the Phalanx for use off ship were marginally adequate. For example, Chillers, an environmental control unit intended to cool the system, was not designed for desert temperatures. Each summer, guns became inoperable for short periods of time when temperatures exceeded a certain level. This required herculean efforts by maintainers to keep them mission capable. Although the program manager managed parts stockage in theater, there was not the equivalent of an Army prescribed load list. This caused repair delays. Incredible efforts were made by Task Force 3-3, Task Force 5-5, and the program manager to establish a list based on parts history. With moderate improvement, there was still reliance on the Navy for certain parts.

Despite the challenges, sailors maintained an unbelievable operational readiness rate through sheer diligence, dedication, and in some cases, creativity. The maintenance control structure was also a challenge with respect to Lightweight Counter-Mortar Radars owned by the task force. LCMR maintenance troubleshooting above Soldier-level required contracted civilians outside the task force. Task Force 5-5 worked closely with the USF-I sensor manager to prevent friction. Future C-RAM missions should ensure sensor contractors work directly for the task force or at minimum, fall under the program manager theater lead. Otherwise, the net result is slower than desired repair time for critical maintenance.

Finally, system maintenance operations were deliberately conducted outside threat indirect fire windows. If credible intelligence was received, maintenance operations were temporarily modified.

Educating C-RAM. As with all complex systems especially relatively new ones like C-RAM, there were misunderstandings in regards to capabilities and limitations. Task Force 5-5 made a purposeful effort to brief new leadership and supported units on sense, warn, and intercept capabilities. For example, there was a common misunderstanding that the intercept capability could be rapidly positioned like a Bradley or M1 Abrams, but without recognition the gun requires considerable resources such as time and site preparation. Another misunderstanding dealt with digital systems that supported the fight against enemy indirect fire. The Advanced

SPC Jermaine Foster, with Joint Task Force 5-5, conducts maintenance on the Sentinel Radar while at Victory Base, Iraq, last year. (Photo courtesy of 5th Battalion, 5th Air Defense Artillery Regiment)

Field Artillery Tactical Data System was designed to support counter fire, and provides precise point of origin data. Forward area air defense calculates points of origin and accurate points of impact along with track data such as elevation and velocity. Together with disciplined operators, there was accurate reporting. However, a common error was to simply use the

Advanced Field Artillery Tactical Data Sstem for point of impact data causing delays in crater analysis do to the margin of error. Explaining C-RAM enabled leaders to make informed decisions. Simply understanding intercept is a point defense weapon system and not an area system that provided a 'magic shield' enabled understanding of why the system may not have engaged an incoming rocket or why the warning was not base wide. In addition, educating C-RAM helped forge new relationships that proved beneficial to successfully operate in theater, ultimately enhancing operations and protecting friendly forces.

C-RAM demonstrated clear relevance in Iraq saving lives due to a remarkable system of systems that included Soldiers, sailors, and civilians. According to Rick Sinnreich's article in the December 2010 Army magazine, "The Dangers of Extrapolating from Today's Wars," there should be an attempt to avoid the failed assumption that "tomorrow's fights will look pretty much like today's." In this vein, there are areas that must be considered as C-RAM evolves into an integrated Fires protection capability.

First, refine software to improve track discrimination against aircraft, small arms fire, and unmanned aerial vehicles, in order to reduce false warns beyond operator training. Second, continue research on audible and visual sound methods to ensure maximum warn both indoors and outdoors to counter noise diminution in urban and built up areas. Third, the fielding speed of sense, warn, and intercept was nothing short of amazing, but there are materiel challenges that should not find their way into integrated Fires protection. The current parts supply and flow must be overcome in order to make the system sustainable. Fourth, additional testing is recommended to further assess sensors that may support integrated Fires protection.

The G-RAF radar may have the capability to clear airspace in support of intercept operations. An effective sensor, the EQ-36 requires additional testing to ensure compatibility and prevent unnecessary false warns especially in the 360 degree mode. Fifth, deployability and mobility improvements would provide commanders flexibility beyond protection of static bases. Sixth, in regards to manning, 131As and 94Ms must be considered part of an integrated Fires protection organization to provide depth and sensor knowledge. A military occupational skill identifier may be helpful to ensure those trained are managed appropriately by human resources command.

Seventh, the program manager theater lead offers a valuable resource to the deployed task force. By being forward, the theater lead had situational awareness, an understanding of commander's intent, and an ability to coordinate priorities with the team in Huntsville, Ala. It is also recommended the PM explore future cost savings by a reduction in quantity of deployed contractors necessary to support an integrate Fires protection capability. Finally, formal establishment of integrated fires protection training and doctrine would be beneficial as the system develops. It would be unfortunate if units continue to relearn the same lessons and rely on techniques passed from unit to unit. Despite assertions, successful auto warns comprised only a fraction of warnings; manual warns conducted by disciplined crews were the majority. Trained and vigilant operators made the warning component work. Primarily through experience in theater, 14Ss and 14Js along with other cross-trained military occupational skills learned to successfully operate the system.

Versatile, thinking Soldiers were required to protect the force. The counter indirect fire fight challenges leaders beyond simple solutions and emphasizes MG David D. Halverson's premise of, "Text-book derived solutions, checklists, and processes continue to limit knowledge growth of our junior leaders and their ability to be adaptive when critical decisions are needed in dealing with complex problems."

Counter indirect fire requires critical thinking and adaptive leaders grounded in full spectrum operations with an ability to solve complex problems. Leadership, officer and noncommissioned officer, must receive extensive instruction on radar theory, capabilities, and limitations. A simple overview as part of the train up is inadequate given the nature of the fight. Training must also educate a relationship between integrated fires protection, counter-fire, and offensive Fires in support of full spectrum fires operations.

During a period of burgeoning national debt and infinite demand for limited resources, what is the value added of an integrated fire protection capability? Major U.S. operations in Iraq are scheduled to end in December 2011 and a condition-based drawdown is planned for Afghanistan beginning June 2012. These wars demonstrated an adaptable enemy, capable of improving tactics, techniques, and procedures in an attempt to offset the advantages of U.S. military training and technology. It is unrealistic to believe future threats will not apply those lessons.

Future clashes in an era of persistent conflict will undoubtedly span full spectrum operations. Indirect fire will be a constant factor. Whether facing a conventional or irregular threat, an indirect fire protection capability is required. Potential adversaries will be determined, adaptive, use wide array of tactics, and seek to avoid strengths. An asymmetric threat will employ commercial off the shelf technology as well as time tested tactics such as indirect fire. Effectively responding to this threat will require continued Fires versatility and a committed effort to apply lessons learned. Defeating a persistent threat requires looking beyond branch parochialisms, emphasizing collaboration between air defense and field artillery, and developing an integrated protection capability to complement an already capable, multitalented full spectrum Fires force.

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Captain Shannon P. Billig, was formally the Task Force Intelligence Officer of 5th Battalion, 5th Air Defense Artillery, 31st Air Defense Artillery Brigade, Fort Lewis, Wash. Prior to 5-5, she served as a flight platoon leader and executive officer for Alpha Company, 1st Military Intelligence Brigade, 66th MI group in Hohenfels, Germany until June 2008. She deployed with Alpha Company conducting IMINT and GEOINT intelligence support missions in Operations Iraqi Freedom and Enduring Freedom. She is a 2009 graduate of the Military Intelligence Captain's Career Course and Intelligence in Combating Terrorism Course.

Sergeant Major Brian K. Damron, is the operations sergeant major for 5th Battalion, 5th Air Defense Artillery, 31st Air Defense Artillery Brigade in Fort Lewis, Wash. His previous assignments include battery first sergeant for Alpha Battery, 5-5 ADA, Fort Lewis, Wash., battery first sergeant for the Air Defense Battery, 3rd Armored Calvary Regiment, Fort Carson, Colo., Bradley/Linebacker platoon sergeant for Bravo Battery ,1st Battalion, 44th ADA Regiment in Fort Hood, Texas. He has been deployed to Iraq in support of Operation Iraqi Freedom and New Dawn for a total of 50 months and worked with the C-RAM Force Protection Weapon System in theater for 27 of those months as a battery first sergeant and battalion operations sergeant major.

Cross Cultural

negotiations, skill building in an operational environment

The Headquarters, Department of the Army, Army Culture and Foreign Language Strategy states that operational experiences in Somalia, the Balkans, Afghanistan, and Iraq have highlighted critical gaps in the Army's capability to influence and operate effectively within different cultures for extended periods of time. Battlefield lessons learned have demonstrated that language proficiency and understanding of foreign culture are vital enablers for full spectrum operations.

Negotiating in indigenous cultures adds new dimensions to the military's missions in Afghanistan, Iraq and elsewhere. Operating in joint interagency, intergovernmental, multinational environments requires a new, more sophisticated set of skills that are very different than the traditional war fighting in a bipolar strategic environment of the Cold War era.

This new dimension is essential for winning hearts and minds of the populace of regions and countries which are of strategic importance to the U.S. and its allies. In this article we will consider the cultural considerations in negotiations, and the factors which influence them in indigenous operating environment.

What is negotiation? Negotiation is derived from the Latin word "negotiari." The root words neg (not) and otium (ease or leisure), in summation meaning "not leisure," and reflects the uneasy nature of negotiations. Negotiation is a process in which two or more participants try to come to a mutual consensus through a process of interaction and communication by using different negotiation techniques and methods.

There are five main elements of international negotiation. (See Figure 1, below).

Three phases of negotiation. Generally, negotiations also consist of three phases. Phase I is the pre-negotiation phase. This is often the most critical phase. Each party identifies its strengths, assesses its interests, and works to find a balance between short-term tactical gains and long-term strategic relationships. Phase II of negotiations consists of the actual negotiation process, and Phase III consists of post-negotiation efforts.

Cross cultural negotiation training. This is an important element of the pre-negotiation phase or Phase I. Negotiators must understand cultural etiquettes as well as cross cultural differences in negotiation styles and techniques when dealing with a Middle Eastern partner. In a cross cultural setting all leaders need to consider cultural factors impacting the negotiation process, which can include different historical, ethnic and cultural backgrounds, possible emotional perceptions, political systems, and their sociocultural origins.

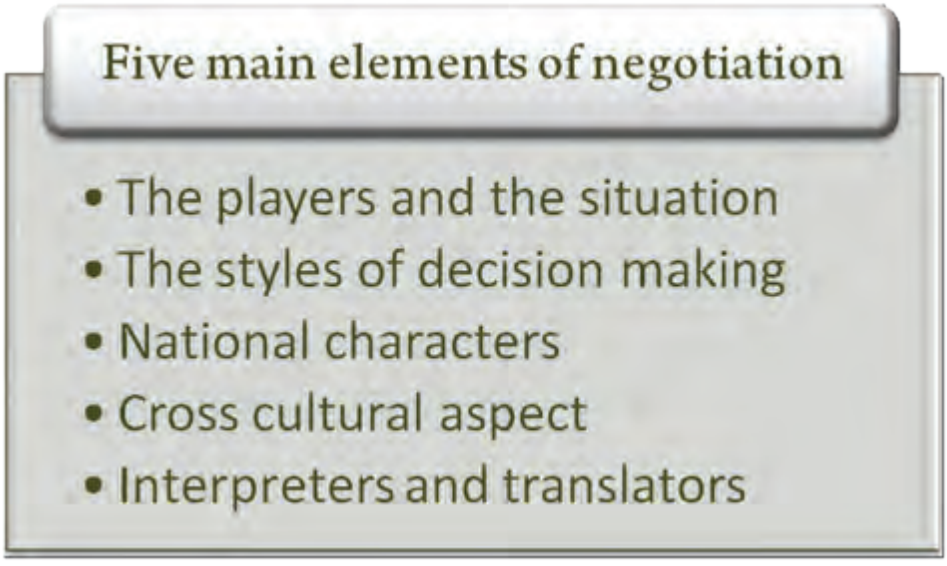

Figure 1: Five main elements of negotiation

What we need to know about culture? Culture (from Latin "cultura" to cultivate) is a combination of behavior patterns, arts, beliefs, and institutions passed down from generation to generation. It's the way of life for an entire society. It includes codes of manners, dress, language, religion, and rituals.

Other important definitions. There are other cultural definitions that leaders need to be aware of when preparing for negotiations, these include cultural knowledge, cultural awareness, cultural sensitivity, and cultural appropriateness. (See Figure 2, right).

Phase I: Pre-negotiation. Just knowing the definitions isn't enough; there are also several things that must be done prior to engaging in negotiations. They include, learning as much as possible about the negotiating partners. This means know the players, their tribal affiliation, and their political and religious agenda. Leaders must identify the initiator of the meeting. If the negotiation request comes from local key or influential leader, it is imperative to identify their socioeconomic, political, ethnic or tribal affiliation.

A leader must also determine an appropriate location for the meeting. If hosting, choose a quiet, private location away from possible internal and external distractions. Lastly, leaders must identify an appropriate translator.

Choosing the right translator. This is very important. If they are local, they might have a biased agenda, tribal affiliation or certain linguistic dialect which might not be well perceived by another negotiating party. Make sure beforehand if a female translator is OK, especially for high level negotiation. It is imperative that a translator be knowledgeable of languages and cultures to avoid possible misinterpretations, especially when it comes to proverbs, idioms etc. and other cultural nuances. Misinterpretations might negatively affect the outcome of the negotiations. Lessons learned have shown that the very lack of cultural knowledge, education and exposure usually leads to misinterpretations.

My experiences throughout the years

in different cultural settings point to that pattern. For example, during a negotiation a Middle Eastern delegation member used the following Arabic proverb, "min kasratil mallahin gariqat as safina." During the discussion, the interpreter literally translated the meaning as, "there were too many sailors on the boat and it sank," when in reality it should have been translated as "too many cooks in the kitchen." Because the interpreter did not have a clear sense of the Western cultural realities, he could not translate the nuances of one culture into another.

Another example where literal translations can cause confusion comes from past negotiations between Western oil companies in the former Soviet Republic of Azerbaijan. An Azeri member of the delegation used the popular Turkic proverb or idiom, "manim gozum sandan su ichmir,'" which actually means, "I am suspicious of you or I do not trust you." The interpreter on the scene translated the proverb literally to mean, "My eye does not drink water from you."

In another incident which took place in Moscow in the '80s, a Russian negotiator used a very popular, old Russian, traditional saying, "vipyem na pososhok," while addressing the departing Western delegation. This saying is usually used by Russians to wish each other "safe travel." Once said, everyone would normally sit for a moment, raise their glasses of vodka, drink, and wish everyone a safe trip.

However, this phrase is very difficult to translate – word for word. The interpreter struggled and could not give an English equivalent. Because the meaning was not clear, the Western delegation was not entirely sure of what was actually said.

In all three cases, the culturally and linguistically incorrect translations caused a major confusion and even laughter and were not obviously helpful for the outcome of the negotiations. These experiences show misinterpretations, either deliberate or because of ignorance of cultural, linguistic, political, ethnic or tribal affiliations, can cause miscommunications.

Phase II: The negotiation phase. During this phase your cultural awareness training is not less important. Some cultures adopt direct, simple methods of communication, while others prefer indirect, more complex methods. Middle Eastern cultures fall into the latter category. When communicating with Arabs, pay attention to body language, eye movement and hand gestures. Any negotiation should begin with greetings.

In the Middle East, negotiators usually prefer longer less formal sessions, insist on addressing counterparts by their titles, and are given to expressing philosophical statements that are often more important to the negotiation process than the technical issues of the problem. In indigenous culture it is extremely important to be culturally sensitive and to show your respect and understanding of the culture of the negotiating partner.

In the Middle Eastern culture the knowledge of the following basics would be helpful:

- Shake hands with the right hand and use the left hand to grasp the other person's elbow as a sign of respect.
- In close, friendly relationship, a hug and a kiss placed on both cheeks upon greeting are a normal occurrence – if the Arab initiates it.
- Placing a hand on the heart with a slight bow is a sign of respect while greeting a person.
- If a Middle Easterner touches you it is a positive sigh, it means that he likes you (not a sign of homosexuality). Rise to show respect when a respected or elderly person enters the room.
- You will be on the safer side if you always rise greeting people.
- Usage of common Arab greetings, even few, such as "As Salam Aleykum," or "Peace be with you" accompanied with or instead of "hello" would very much please an Arab person.

When communicating with Arabs, pay attention to body language, eye movements and hand gestures. Other "Do's" and "Don'ts" cultural basics during the negotiation process are extremely helpful as well. (See Figure 3 and Figure 4).

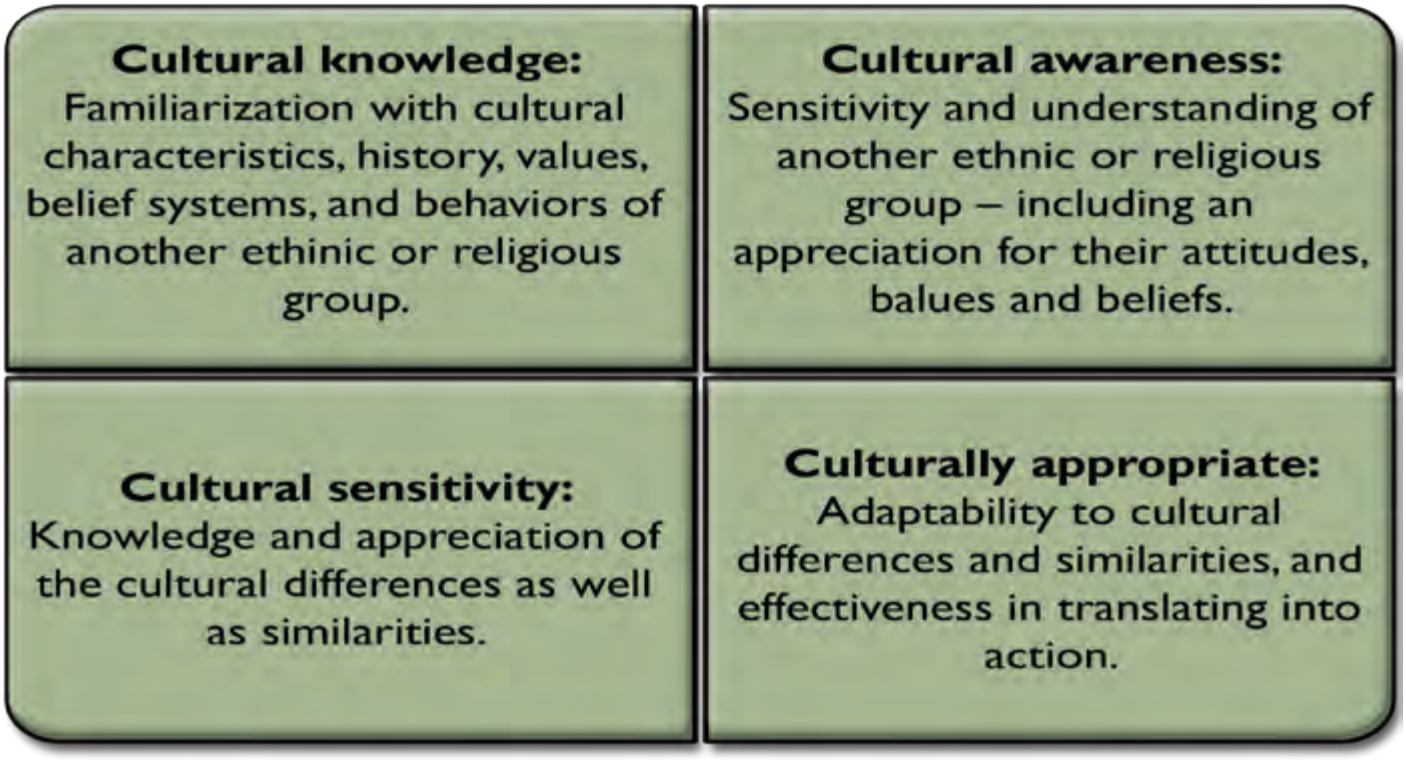

Figure 2: Cultural definitions

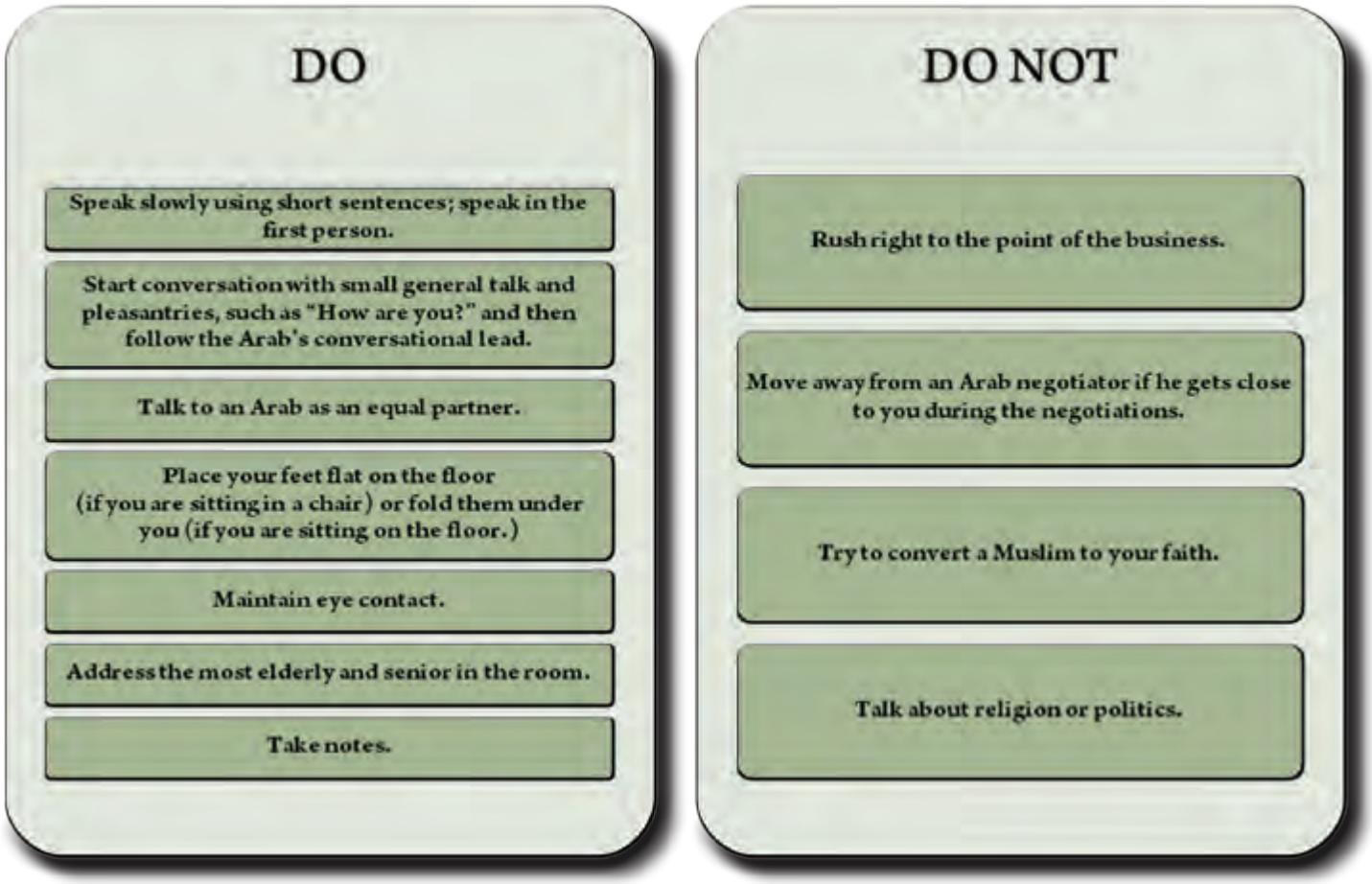

Figure 3: Basic do's and don'ts during the negotiation phase

Each culture also had contrasting views of negotiating. Gaining an appreciation for the contrasting views is vital. Different cultures also have different views about the appropriateness of displaying emotions.

Arab negotiators, in a high-context culture, are more likely to show emotions than Americans. However, in Afghanistan, specifically the Pashto culture, a display of emotion like impatience, anger, etc. is considered a sign of weakness. (See Figure 5 on page 45).

Phase III: Post-negotiation phase. Goals reflect the purpose or intent of the parties to a negotiation. In business, American negotiators typically regard the signing of a contract between the differing parties as their primary goal. They consider the contract a binding agreement that outlines the roles, rights, and obligations of each party. Americans prefer detailed contracts that anticipate all possible circumstances. These agreements or contracts are usually binding and not subject to further negotiation or debate.

This is known as the "Western Tradition of Legalism." However, Middle Eastern negotiators tend to begin negotiations by establishing general principles that become the framework on which to build an agreement. They usually seek sustainable relationships rather than contracts and "prefer to leave things vague."

This is known as the "Middle Eastern Relationship of Trust." Middle Easterners, however, prefer an agreement in the form of general principles rather than detailed rules. Middle Easterners regard an agreement as being relatively

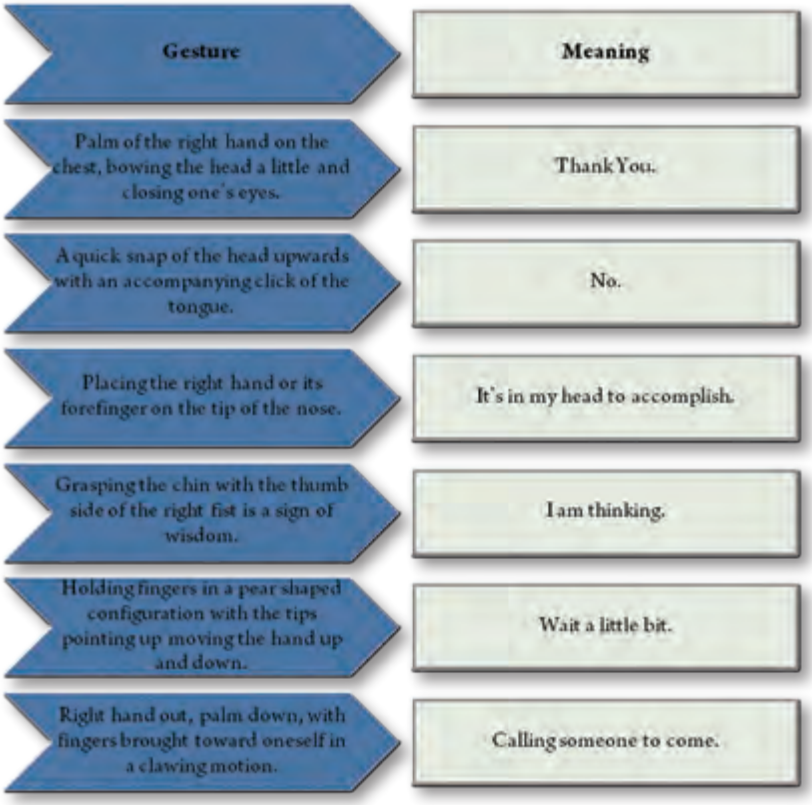

Figure 4: Appropriate gestures and body language

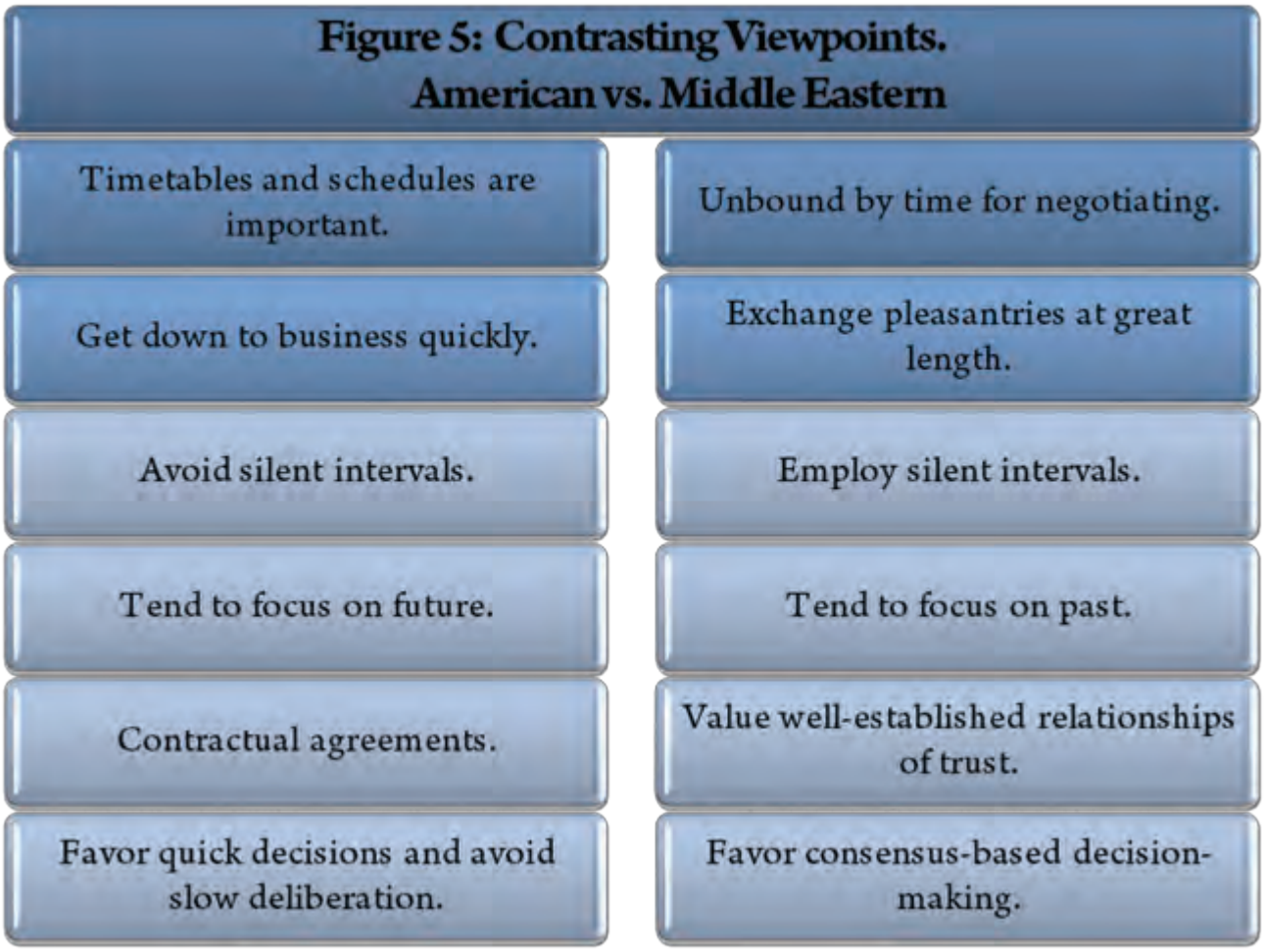

Figure 5: Contrasting viewpoints, American vs Middle Eastern

flexible and symbolic of the relationship established, rather than a binding legal document.

Deductive versus inductive processes for negotiations. A Western negotiating team typically organizes itself using a deductive process. Essentially, the group will organize in culturally specific ways that reflect and affect how the group makes decisions. A negotiating team usually will have a designated leader who appears to have complete authority to decide all matters.

An Arab negotiating team typically uses the inductive process. In the Middle East, a hidden authority rests with the group, and, as aforementioned, decision making often occurs through consensus. Thus, negotiating teams may be relatively large due to the greater number of personnel thought to be necessary to the decision-making process.

Some cultures are more risk-averse than others. In general, Middle Easterners seek to avoid uncertainty. This proclivity affects their willingness to take risks in a negotiation. In Arab and Middle Eastern cultures, 'saving face' and the use of 'interpreters' are strategically important.

Face has to do with a person's reputation and the respect in which others hold him. In negotiation, although compromises are reached, they must be done in a manner that allows the Arab partner to maintain dignity or prestige and not appear weak. In addition to attaching high importance to creating bonds of friendship and trust between negotiators, Arabs believe it is imperative that negotiating partners respect each other's honor and dignity.

To an American, losing face may be embarrassing, but to an Arab, it is devastating. Losing face is the ultimate disgrace, and an Arab will go to almost any length to avoid it. U.S. leaders must keep the concept of "face" in mind when conducting negotiations in the Middle East. Failure to do so could freeze or kill a negotiation. Face and the allied concepts of honor and shame are important in the Middle East.

End negotiations with a strong stance. Once objectives have been achieved, summarize what has been agreed to and confirm the key points. Do not allow the negotiating partners to do so, this places them in power. Use common courtesy and tact, in an effort to not offend the partners. Try not to rush or push; it might postpone or kill the agreement. It's important to maintain control of the negotiation throughout the entire process, including the closing.

Negotiating is a way of life in Arab cultures. Apply these cultural and negotiation strategies and any mission will reap the benefits.

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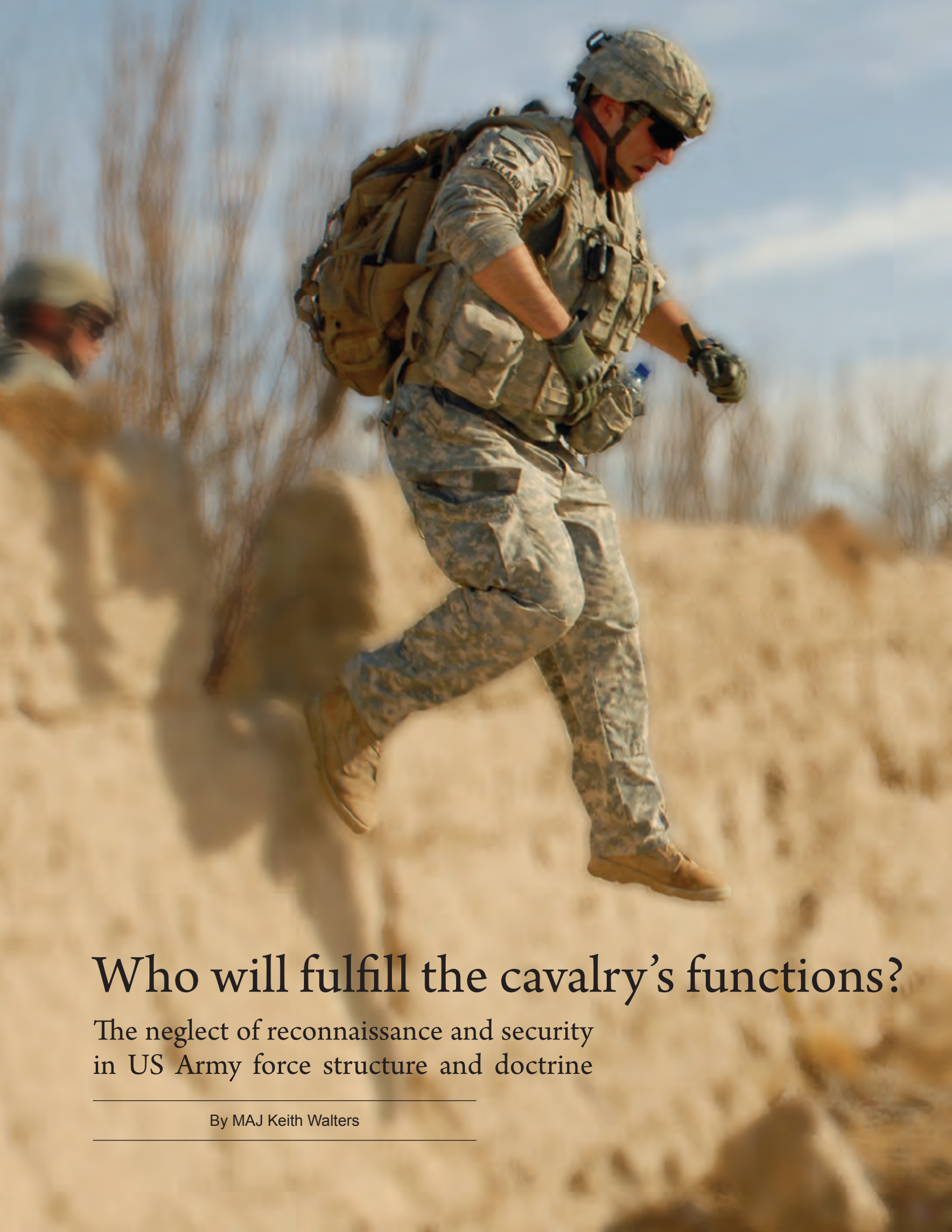
Dr. Ibrahimov specializes in the cultural issues of the former Soviet Republics, south central Asia, and the Middle East. He is the author of "An Invitation to Rain: A Story of the Road Taken to Freedom," and numerous other publications. His next assignment is as the U.S. Army's senior cultural and foreign language adviser at Fort Leavenworth, Kan. Dr. Ibrahimov can be reached at mahir.ibrahimov@us.army.mil.



Who will fulfill the cavalry's functions?

The neglect of reconnaissance and security in US Army force structure and doctrine

By MAJ Keith Walters

After nearly a decade of war in Afghanistan and Iraq, counterinsurgency theorists have emerged as the most influential voices in the intellectual debate shaping Army doctrine. The Army has gained COIN expertise at the expense of combined arms core competencies. U.S. Army Training and Doctrine Command Pam 525-3-0: *The Army Capstone Concept,* 2009 began to address this emerging imbalance by restoring the concepts of conventional action and initiative as centerpieces of Army doctrine. Even as the 2009 ACC promotes the centrality of these themes to future joint and Army doctrine, the Army has elected to dismantle the last unit organized and equipped to provide full spectrum reconnaissance and security at the corps and joint task force level. When the 3rd Armored Cavalry Regiment converts to a Stryker Brigade Combat Team in 2011-2012, the Army will face the future without a full spectrum reconnaissance and security force. Army leaders must reconsider the 3rd ACR-SBCT conversion.

PFC Andrew Ballard, infantryman, assigned to 2nd Squad, 3rd Platoon, Company C, 1st Battalion, 66th Armored Regiment, 1st Brigade Combat Team, 4th Infantry Division, jumps down from a mud wall while his squad pulls security during a foot-patrol in Arghandab District, Jan. 31. (Photo by SPC Breanne Pye, U.S. Army, photo illustration by Jennifer McFadden)

Fiscal and manpower constraints stemming from the ongoing wars in Iraq and Afghanistan, inefficiencies in the Army Force Generation model, and a misguided faith in the efficacy of remote sensors and unmanned platforms all contributed to this decision. Analysis of the long-term consequences highlights its shortsightedness. With the 3rd ACR-SBCT conversion, the abstract intellectual debate among Army officers and defense analysts as to whether the Army will be a force geared for counterinsurgency or one that deters and defeats conventional threats now has dire implications. If the Army continues to highlight COIN tactics, techniques, and procedures over core combined arms competencies, the operational and tactical levels of the Army will suffer. Resolving this debate in a manner that considers both current operations and projections of the future operational environment is essential. The experiences of U.S. forces in Afghanistan and Iraq and those of the Israeli Defense Forces in Southern Lebanon suggest that combined arms competence must be a central tenet of an Army that can fight for information and develop situations through action.

The future of reconnaissance and security. The 2009 ACC describes the capabilities the Army will need to dominate across the full spectrum of operations in the period from 2016 to 2028. It notes technological advances and emerging threat capabilities that will inform the organizational and doctrinal requirements of the future force. To meet the challenges posed by enemies wielding both conventional and unconventional capabilities, the ACC introduced *operational adaptability*, a concept that emphasizes the fundamentals of mission command and decentralized operations.

Operational adaptability enables Army forces to accomplish the diverse array of missions that brigade combat teams and subordinate small units will face in isolated, distributed areas of operation.

A single Joint task force, for example, may receive the mission to destroy a conventionally armed and organized enemy while simultaneously securing the area's population from insurgents using irregular means and methods. At the core of a joint task force will be its brigade combat teams with sufficient combined arms combat power to defeat conventional enemies while retaining the ability to apply the hard-won irregular warfare TTP learned in Iraq and Afghanistan. These teams will have to be adaptable and able to fight for information against enemies with diverse capabilities. It also states that operational adaptability means that Army leaders down to the platoon and squad levels must have an understanding of the situation in context; that combined arms formations must have the ability to act in concert with joint, interagency, intergovernmental, and multinational partners; that tactical formations have the requisite collection, analysis, and dissemination capabilities to process information needed by commanders and units to continually assess, learn, and adapt; and that units at all levels be sufficiently organized and equipped to exploit opportunities, consolidate gains, and transition efficiently between tasks and operations.

These capabilities pertain to the entire future force, but have particular relevance to the reconnaissance and security capabilities required to mitigate the uncertainty and complexity of future battlefields. It is troublesome that current and projected Army force structure addresses reconnaissance and security shortcomings with technological solutions, rather than combined arms solutions.

Combined arms capabilities, however, are the foundation of operational adaptability. The current organization of the ACR provides the ideal structure to achieve operational adaptability. New weapons systems that leverage the technological advances of the coming decade will enhance the ACR's broad capabilities. The Army can and should continue to field the ACR as its optimal full spectrum combined arms formation, even as it integrates the component tenets of operational adaptability in its BCTs by fielding new technologies and developing and educating leaders.

Ominously, the current trajectory of the Army — one that addresses current COIN commitments at the expense of full spectrum capabilities — does not reflect the themes of the ACC. The conversion of the 3rd ACR is emblematic of this trajectory. The loss of significant reconnaissance and security capabilities in the force portends difficulties in meeting the challenges of the future. The ACC's supporting ideas demand greater reconnaissance and security capabilities than currently exists. Even if the end product does not look precisely like the current ACR, the future Army needs formations capable

SGT Eduardo Avila, squad leader, assigned to 2nd Squad, 3rd Platoon, Charlie Company, 1st Battalion, 66th Armored Regiment, 1st Brigade Combat Team, 4th Infantry Division, leads his squad up an embankment in Arghandab District. Avila, was conducting a foot patrol with his squad to search orchards throughout the district and build rapport with the local population. During their patrols, 2nd squad must maneuver their way through the Arghandab's many obstacles, including: farmer-built mud walls, irrigation canals, densely populated orchards, foot-wide pathways through long stretches of boggy flats and even a 30-foot-tall wall they must climb during their patrol. (Photo by SPC Breanne Pye, U.S. Army)

of conducting full spectrum reconnaissance and security operations. The ACC presents a vision of future combat in which reconnaissance and security capabilities play the central role in the ability of the Army to successfully operate in uncertainty.

The fight for information. If the Army is to deploy largely to austere environments among populations with distinct non-Western cultures, pre-deployment engagement and analysis will be critical to the long-term success of the force. Regardless of the type of threat, the Army must retain the ability to fight for information to develop sound analyses of the physical terrain and human dynamics confronting it. This places a premium on the collection and development of intelligence at all levels of command. Furthermore, commanders at all levels and in any type of operation—from stability to high intensity battle—must have the physical ability to exploit opportunities and control the tempo of operations. The ACC highlights this mind-set in its implicit call for leaders to maintain the freedom of action to seize and maintain the initiative and to develop any situation through decisive action. Finally, the Army may find itself conducting distributed combined arms operations, with ever smaller units operating far from command and control and sustainment nodes. The forces executing such operations will rely upon decentralized authority at the point of decision. With authority, however, comes the heavy responsibility to make informed decisions derived from reconnaissance and security operations that require tactical commanders to understand and develop the situation through action in their operational areas.

Action and initiative are the common threads of these ideas that are implicit in the ACC's call for operational adaptability. Most significantly, these points all address the need for decentralized reconnaissance and security capabilities at the operational and tactical levels. In current force structure, the 3rd ACR is the only formation that fulfills these requirements; without the 3rd ACR, the Army loses much of its ability to retain initiative in full spectrum operations. The need for a combined arms force, capable of reacting to developing situations and fighting and surviving in complex environments highlights the shortcomings in existing brigade combat team structure. The ACR fields combined arms teams with greater mass and mobile, protected firepower than its BCT counterpart.

Army force structure for reconnaissance and security. The 3rd ACR-SBCT conversion leaves the Army without full spectrum reconnaissance and security capabilities at echelons above the BCT. Current doctrine addresses reconnaissance and security in the context of COIN. It provides little substantive discussion of reconnaissance and security capabilities in mid- to high-intensity conflicts against enemies organized and equipped with even limited conventional capabilities. The resulting vulnerabilities in Army force structure have not been evident in Iraq and Afghanistan, but they entail problems in future possible operational environments.

SGT Johnathian Defibaugh, team leader, assigned to 2nd Squad, 3rd Platoon, Charlie Company, 1st Battalion, 66th Armored Regiment, 1st Brigade Combat Team, 4th Infantry Division, uses a knife to check the ground for a piece of metal while his squad holds back to pull security during a foot patrol in Arghandab District, Iraq. (Photo by SPC Breanne Pye, U.S. Army)

Battalion commanders have assigned reconnaissance and security functions to organic units in Iraq and Afghanistan, and corps and joint task force commanders have been able to depend upon intelligence from BCT assets operating in their own dedicated areas of operation. Existing reconnaissance and security doctrine and force structure have been adequate in meeting unit needs in the current operational environment. However, they are insufficient in an environment that contains conventional and/or hybrid threats.

Conventional armies that serve governments hostile to the United States still exist. Russian, North Korean, or Chinese conventional forces, for example, employ counter-reconnaissance forces that can easily subdue existing BCT reconnaissance and security forces using superior mass and mobile, protected platforms. Such enemies will likely utilize irregular means and methods in conjunction with conventional forces. For example, even though Hezbollah did not have the conventional combat power of even a single North Korean mechanized company, it employed a hybrid combination of weapons and TTP that overwhelmed Israeli forces in northern Lebanon in 2006. The Israelis had not organized and trained to defeat forces with conventional capabilities. The U.S. Army today is similarly untrained and ill-structured to defeat such enemies.

The Army must recalibrate its doctrine and force structure to reestablish conventional dominance. In contingencies against conventional and hybrid forces, Army corps commanders will need reconnaissance and security capabilities to best inform the employment of BCTs. Current and projected Army force structure lacks sufficient reconnaissance and security capabilities. Battlefield surveillance brigades are not the solution. Current doctrine assumes that BfSBs can fulfill the role that the ACRs once performed for corps-level commanders.

The primary mission of the BfSB is to conduct intelligence, surveillance, and reconnaissance missions in support of a division, corps, joint task force, other service, or multinational force, but doctrine as stated in U.S. Army Field Manual-Interim 3-0.1, *The Modular Force, requires BCTs to augment the BfSB*. The BfSB is ill-equipped

PFC Isaias Rodriguez, infantryman, assigned to 2nd Squad, 3rd Platoon, Charlie Company, 1st Battalion, 66th Armored Regiment, 1st Brigade Combat Team, 4th Infantry Division, hands candy to an Afghan girl Jan. 31, during a foot-patrol in Arghandab District. Rodriguez is a native of Edinburg, Texas and is serving his first combat deployment with the Iron Knights. (Photo by SPC Breanne Pye, U.S. Army)

to perform its mission in a full spectrum environment. Organized and equipped mainly for passive collection of information with a reconnaissance and surveillance squadron that provides only limited mounted reconnaissance and long-range surveillance capabilities to the brigade, the BfSB lacks organic, mobile, protected firepower. Thus, it lacks the ability to fight for information when necessary, to exploit operational and tactical opportunities, and to develop a situation through action.

Many of the issues that afflict the BfSB also hinder reconnaissance and security operations in BCTs. Armored reconnaissance squadrons of heavy BCTs and reconnaissance squadrons of infantry BCTs and Stryker BCTs, for example, lack sufficient dismounted manpower to conduct reconnaissance, surveillance, and security in COIN; furthermore, they lack the firepower and protection to conduct reconnaissance and security missions at the high end of the conflict spectrum. Although the armored reconnaissance squadrons seem to be the descendant of the division cavalry squadron, the reality is that they bear little resemblance in structure and capabilities. Many former armored reconnaissance squadron commanders are critical of the unit's table of organization and equipment, noting that insufficient manpower denied them tactical flexibility in COIN operations in an urban environment. They adapted through combined arms competencies and used superior firepower and technology to overcome their structural deficiencies against insurgents in Iraq and Afghanistan. However, enemies in higher-intensity conflicts may not yield as easily to superior American training, firepower, and technology.

The current modular U.S. Army has not fought capable conventional forces. Shortcomings in reconnaissance and security are worrisome in training exercises against opposing forces using conventional armored vehicles (such as Soviet BRDMs and BMPs) and insurgent teams with rocket propelled grenades and IEDs. Friendly platoons and troops habitually violated the basic tenets of reconnaissance doctrine. Cavalry formations are supposed to set the conditions for the decisive commitment of the main body, but insufficient manpower, protection, and firepower caused these platoons and troops to become decisively engaged upon contact, often forcing the commander to commit more combat power to reinforce or relieve them.

The ability of current reconnaissance and security formations in the Army's BCTs to set these conditions in mid- to high-intensity battle is doubtful, but at least they have dedicated formations to fulfill these functions.

Joint task force commanders do not. It is unlikely that they would be willing to go into battle without dedicated reconnaissance and security assets. Using BCT units for reconnaissance and security or to augment BfSBs is the only alternative.

The loss of combat power. While trying to fulfill the reconnaissance and security requirements of higher headquarters, it is inevitable that it will affect the ability of commanders from company through brigade to fight for, analyze, and disseminate intelligence across their formations. Units will increasingly rely upon corps-level headquarters or unreliable networks for actionable intelligence. This perpetuates an outdated reliance on higher headquarters. Army leaders trumpet the idea of decentralization and call for diffusion of responsibility and combat enablers to the lowest feasible levels of command, but their decision to convert the 3rd ACR will trigger the opposite reaction. The continued dilution of reconnaissance and security capabilities, exemplified by the fielding of armored reconnaissance squadrons in heavy BCTs and the reconnaissance squadrons in infantry and Stryker BCTs, and the conversion of the 3rd ACR, will centralize information and intelligence at the corps and Joint task force level. This is not progress toward meeting future challenges, nor is it consistent with the ACC.

Another danger to the Army is the erosion of the professional expertise required to operate such organizations. The fiscal and intellectual costs of reestablishing it to field heavy reconnaissance and security formations will be prohibitive. The 3rd ACR today has the highest concentration of reconnaissance and security expertise in the Army. The skills and expertise of individual soldiers in scout sections and on regimental staffs will be relics of military history as the Army wrestles with force structure and procurement challenges and makes decisions that fail to address the complexity and uncertainty of the future. The concurrent fielding of BfSBs will put soldiers into positions that fulfill many of the intelligence staff functions of the current ACR, but the skills related to the collection of intelligence—the ability to conduct doctrinally sound reconnaissance and security operations—will be lost as the Army neglects these skills in favor of population-centric COIN tactics, techniques, and procedures.

The impact of the 3rd ACR-SBCT conversion will be felt in the loss of full spectrum reconnaissance and security capabilities required to meet the versatile enemies of the future. The ACC contends that competency in combined arms operations is the indispensible foundation for future Army forces. At its core are ideas that will enable the Army to fight and win in any form of armed conflict.

Of all existing brigade-sized formations, the ACR fields the most powerful organic combined arms capabilities down to the company level, a feature that gives it the requisite level of tactical flexibility to meet projected challenges. Defeating future adversaries will require organizations that can fight for information through physical reconnaissance and human intelligence, but the Army will not be able to field such capabilities in sufficient quantities.

Mission command, decentralization. These are inseparable concepts that call for commanders to promote initiative at the lowest feasible level. To execute effective decentralized operations, BCTs and corps or Joint task forces must have organic reconnaissance and security capabilities. The BfSB currently is incapable of providing the requisite level of situational understanding in operations against conventionally armed and equipped formations or hybrid forces that employ both regular and irregular means and methods. The BfSB lacks the assets necessary for corps-level security operations. Existing Russian, North Korean, and Chinese counter-reconnaissance capabilities accentuate this point.

Furthermore, the BfSB's reliance on passive surveillance and the shortage of platforms that provide operational and tactical mobility hinder its flexibility for intra theater maneuver. Without an organization designed to perform reconnaissance and security, the corps or joint task force commander must draw those capabilities from subordinate BCTs, depleting the already limited amount of combat power available to BCT commanders.

Combined arms competence is the requisite characteristic of a winning military organization regardless of where its mission falls on the conflict spectrum. To meet future challenges, the Army must field formations that can fight for information, develop the situation through action, and exploit operational and tactical opportunities. The ACC contends that decentralization of these capabilities will be beneficial for the future force.

Changing the trajectory of the Army as it operates in Afghanistan and Iraq will be quite a task, but it is an urgent endeavor. Restoring these capabilities after the conversion of the 3rd ACR will be too costly and time consuming, leaving the Army vulnerable to adversaries' full-spectrum capabilities. Political leaders dictate the types of conflicts the Army fights, but even as the Department of Defense enters a period of constrained resources, the Army retains the ability to shape the type of force it fields. A corps-level Joint task force headquarters lacking a powerful organic reconnaissance and security formation will be vulnerable, blind, and subject to the initiative of its adversaries.

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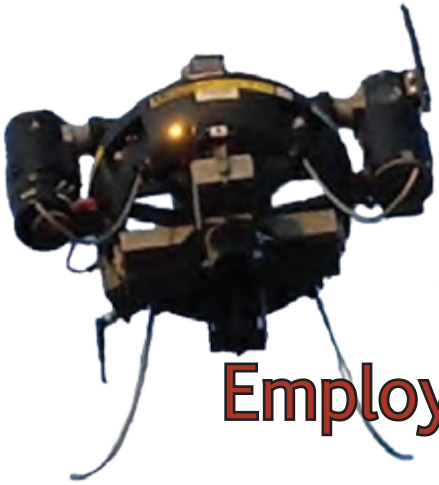
PFC Zachary Fleck, infantryman, assigned to Company C, 1st Battalion, 66th Armored Regiment, 1st Brigade Combat Team, 4th Infantry Division, stands guard Jan. 31, in a tower at Combat Outpost Johnston in Arghandab District. Fleck, a native of Brownsburg, Ind., is a vital part of COP Johnston's force protection guarding the main road. (Photo by SPC Breanne Pye, U.S. Army)



A new way

Employing the Small Unmanned Aircraft

By CPT Michael J. Centola and SFC Robert A. Kaufmann

During Operation Iraqi Freedom 09-10, 2nd Battalion, 23rd Infantry Regiment, Tomahawks, were faced with a severe explosively-formed projectile threat while assuming their new operations environment, just south of Camp Taji, Iraq. The threat occurred at night and generally targeted logistic patrols operating along the main supply route, Tampa. To combat the threat in the area, 2-23 Infantry conducted patrols attempting to interdict the enemy along the main supply route nightly. The operation was called "Tomahawk Thunder." However, the threat was not neutralized and attacks continued to occur several times per week. A targeting work group, headed by the battalion fire support officer, implemented a psychological operation initiative, augmenting the existing Operation Tomahawk Thunder. A multi-tiered approach was created and it was renamed Operation Toma-Hawkeye. The bulk of the operation involved using small unmanned aerial systems as a psychological enabler, while still serving as a combat multiplier.

Plan of action. Operation Toma-Hawkeye, broken down into three phases, allowed the battalion to effectively increase, or decrease the amount of perceived, U.S. forces present along the main supply route. The purpose, of the operation, was to deny the enemy freedom of maneuver to conduct attacks along the MSR. Success was measured by a decrease in the amount of improvised explosive devices and EFPs detonated along a 12 km stretch of MSR Tampa. Additional targeting efforts, separate from Toma-Hawkeye, focused on the kill/capture of IED/EFP manufacturers, transporters and emplacers. The three phases were designed to work both independently and congruently, in order to neutralize the effectiveness of the enemy attacks across the battlespace. The daily threat situation dictated which phase of the operation would be implemented, in order to assess the amount of presence the unit needed to display.

The first phase of the operation included the installation of psychological operations signs along the MSR. These three by five foot signs stated, in Arabic, U.S. forces were conducting operations in the area to increase public safety. It was hoped that the signs would serve as a deterrent to the insurgents placing EFPs in the area. However, due to contracting and printing issues, the signs were actually implemented after phase II of Operation Toma-Hawkeye had begun.

The second phase of the operation involved the flight of SUAS during Operation Tomahawk Thunder. In addition to having organic Ravens, Small Unmanned Aircraft System (RQ-11), to perform "beyond visual line of sight" reconnaissance, surveillance, and target acquisition coverage of marginal maneuver areas, the Tomahawk Battalion was fielded the gasoline micro air vehicle. This vertical take-off and landing aircraft with persistent stare capability, was a SUAS in its trial phase and primarily used by engineer units in Iraq.

Upon learning of the system's abilities, the battalion fire support noncommissioned officer sought out and acquired one system which consisted of two gasoline MAVs for each company. The system provides the operator with a real-time, infrared and electro-optical day and night video that can be seen by units equipped with the

A gasoline-powered micro air vehicle, or gMAV, sits on display in front of a Humvee at the 4th Stryker Brigade Combat Team, 2nd Infantry Division headquarters at Camp Liberty. The gMAV is used by 38th Engineer Company during route clearance missions. (Photo by SGT Bryce Dubree, U.S. Army)

# of targeting:

System as a psychological operations enabler

station remote video terminal. The loud operating noise of the gMAV would prove to be a key deciding factor in the success of Operation Toma-Hawkeye.

The third and final phase, of Operation Toma-Hawkeye, included the use of indirect illumination fires, from 155 mm, 120 mm and 2.75 inch rockets. This phase, used for imminent threats of an attack along the MSR, was placed on order with an event oriented trigger. This phase was also to be used if attacks continued to occur, in the same area, despite Tomahawk Thunder, the psychological operations signs and the gMAV operating simultaneously. However, because of a consistent threat, phase III was not required. Rather, the illumination rounds (120 mm) and (120 mm and 2.75 illumination rocket) were used as a result of intelligence reporting, showing attacks were likely to occur. In total, 28, 120 mm illumination rounds were fired in two, separate operations.

The first fire mission, supporting Operation Toma-Hawkeye, took place at the operation's beginning, establishing the battalion's new psychological approach. The second and final fire mission occurred more than two months later when weather began to thwart gMAV flights. The success of the psychological disruptive effect, caused by the operating noise of the gMAV, prevented the need for this phase more than twice.

History and utilization of the gasoline micro air vehicle. The gMAV was fielded to the 4th Brigade, 2nd Infantry

A Stryker and its team out on a mission during Tomahawk Thunder, Camp Taji, Iraq. (Photo courtesy of 4th Stryker Bigade Combat Team, 2nd Infantry Division, Public Affairs Office)

A U.S. Army M1126 infantry carrier vehicle, also known as a Stryker, from 4th Stryker Brigade Combat Team, 2nd Infantry Division, passes traffic during a mission from Camp Taji, Iraq. (Photo courtesy of 4th Stryker Brigade Combat Team, 2nd Infantry Division, Public Affairs Office)

Division's 38th Engineer Company, to assist in route clearance. Upon learning of the in-depth system capabilities, the 2-23 Infantry battalion commander directed the battalion staff to research and determine if the system could be acquired and used to extend the operational reach of battalion's platoons. The battalion fire support NCO spearheaded the effort to acquire the systems and train selected operators. Although, until the equipment acquisition was approved, the 38th Engineer Company was tasked to provide 2-23 Infantry with a system and an operator to fly during Tomahawk Thunder. The battalion owned and operated the gMAV for approximately 120 days, and it logged nearly 70 flight hours in support of Operation Toma-Hawkeye.

The use of the gMAV systems were available before the psychological operations signs (listed in Phase I) could be printed and before results could be seen along the MSR.

The platoon conducting Tomahawk Thunder used the gMAV and operator before and during their missions. The unit would fly for approximately 30 to 60 minutes a night (depending on the weather). During these flights, the gMAV would conduct an aerial reconnaissance focusing on suspected insurgents who may be collecting sensitive information and placing IEDs. It would also work with the battalion tactical operations center's personnel monitoring Predator or Shadow feeds to investigate suspicious heat signatures. Explosively-formed projectile attacks ceased immediately after the first flight of the gMAV (which occurred two days following an EFP attack on the MSR).

A proof-of-concept was developed to monitor the amount of flight time and days the gMAV was used during Tomahawk Thunder. The human collection team, supporting 2-23 Infantry and the Tomahawk Battalion leadership, were tasked to ask about the gMAV and gauge responses during engagements with the population and Iraqi army leadership.

Response from the local populace indicated that they knew U.S. forces were conducting operations in the area because they could either hear or see the flying equipment (gMAV). Iraqi army personnel, at checkpoints, also believed Soldiers were observing their own checkpoint operations, which motivated them to stay awake while on duty.

The sound emitted by the gMAV's motor was disruptive in nature, portraying to the enemy the area was not safe for them to operate in. As a result, over the next 100 or so days, IED and EFP activities, during peak convoy times ceased along the 12 km section of MSR Tampa.

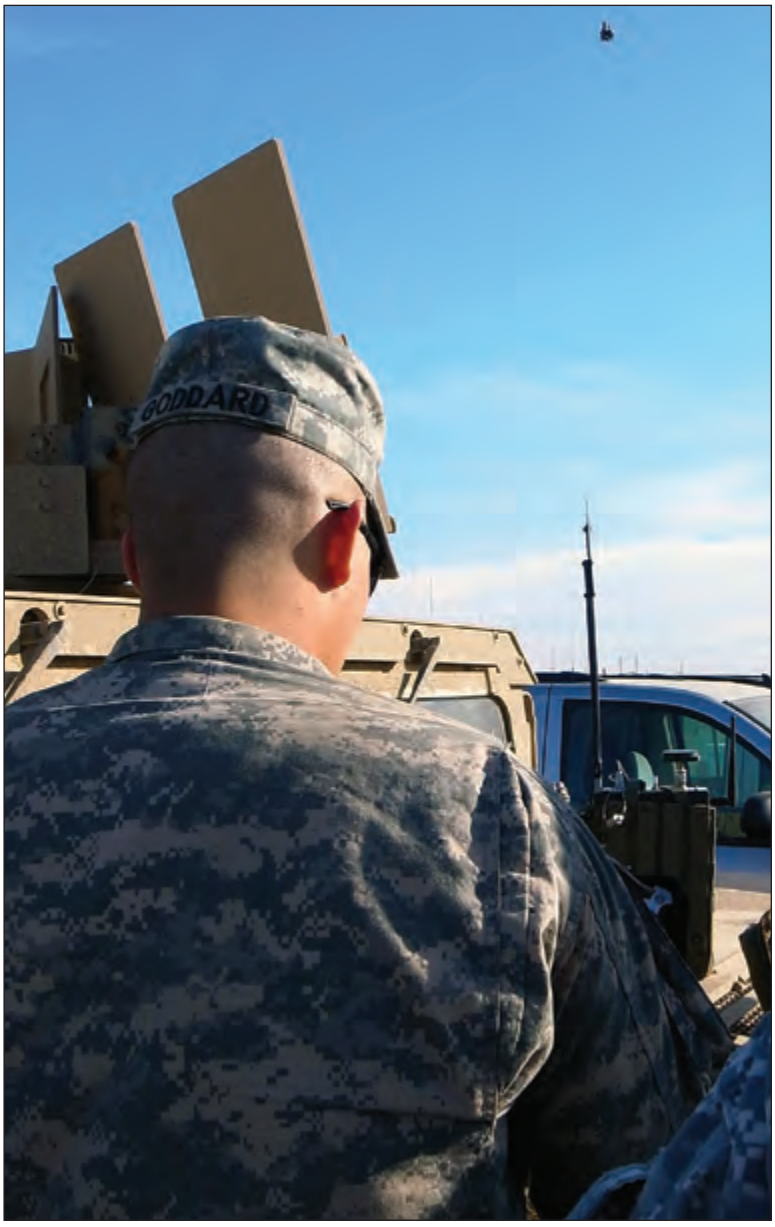
Limitations of Toma-Hawkeye. Of the three phases in the Toma-Hawkeye operation, phase III was difficult to utilize when needed. Approval processes for illumination missions went through a very bureaucratic approval process regardless of munitions' type (155 mm, 120 mm, or 2.75" rockets). Although often cited by the population and Iraqi Security Forces as extremely successful when utilized, this phase of the operation was used sparingly.

Weather played a significant role on the availability of gMAV system flight hours. For the period of December 2009 through March 2010, extreme weather prevented the gMAV system from flying. Winds above 20 knots, was the most common cause for the gMAV to be grounded. There were numerous times the gMAV would launch and winds would force a premature landing.

During Operation Toma-Hawkeye, two gMAV systems were destroyed (and rebuilt) due to hard landings. Although the

investigations concluded that the hard landings were not a result of negligence, the process was long and included a lot of paper work and drug tests for the pilots (blood and urine). Because pilots faced potential for financial liability and other stressors, they no longer wanted to fly the system for fear of repercussions if the gMAV was damaged as a result of combat operations. The investigations tied up man-power hours and prevented the pilots from flying until blood and urine tests came back clean.

This forced a shift in tactics and the less effective RAVEN was used to log flight hours in support of Operation Toma-Hawkeye. When a RAVEN is damaged, as a result of combat operations, parts are swapped 'one for one' with limited paperwork required. A significant limitation of the RAVEN however, is its inability to hover. The gMAV system could hover over and persistently stare at an object from different angles until the threat was either determined safe or unit explosive ordnance device personnel were dispatched to respond.



SGT Marqus Goddard, a combat engineer with 38th Engineer Company, pilots a gasoline-powered micro air vehicle, or gMAV, hovering in the distance in front of the 4th Stryker Brigade Combat Team, 2nd Infantry Division headquarters on Camp Liberty, Iraq. The gMAV is used by engineers during route clearance missions. (Photo by SGT Bryce Dubree, U.S. Army)

Recommendations for future use. The Toma-Hawkeye psychological operation was successful in preventing IEDs and EFPs from detonating along the 12 km stretch of MSR Tampa. The enemy knew that U.S. forces were conducting operations along the MSR, even if they could not pinpoint the exact location. Predominately the enemy traditionally sought out soft targets, but as operations continued the MSR became a hard target. The psychological operations signs gave the population the perception that operations were being conducted for their safety. The disruptive sound of the gMAV system made it known the sign was not just an empty threat but indeed U.S. forces were in the area.

This integrated campaign allowed the unit to extend its operational reach because it gave the impression that a larger area of ground was being covered and secured. The loss of the gMAV system, due to the retrograding of field service representatives from Camp Taji and the amount of scrutiny placed on a hard landing, caused the operation to lose its effectiveness. As a result, some IEDs and EFPs have been discovered along the MSR, but to a much smaller extent than prior to Operation Toma-Hawkeye.

The gMAV system continues to be refined and updated with new features. Newer models have the ability to perch and stare, giving the system the ability to land on an object (such as a rooftop), turn off the motor, and to stealthily observe an area of interest before starting up and returning to the operator via remote. This feature would also allow the operator to stay inside a vehicle platform when launching the system. For operations in areas where there is a high threat of precision small arms fire, such as in an urban environment, this feature would aid in the safety of operator.

About the unit. Soldiers with the 2-23 Infantry, deployed to Iraq in September 2009 as a part of the 4th Stryker Brigade Combat Team, 2nd Infantry Division, in Multi-National Division Baghdad, renamed United States Division-Center during the 12-month rotation.

The Tomahawk Battalion was responsible for more than 600 km of battlespace within the Taji Qadaa and was headquartered out of Camp Taji. The battalion Fires and Effects Coordination cell managed restricted operating zones throughout the battalion's battlespace.

The process of restricted operations zone approval and gMAV system incorporation, in operations developed by the battalion's Fires and effects coordination cell, was later published as a best practice by a visiting joint expeditionary team.

CPT Michael J. Centola was commissioned as a U.S. Army Field Artillery second lieutenant in 2005 from the University of Minnesota's ROTC program. He became the battalion fire support officer and effects coordinator for 2nd Battalion, 23rd Infantry Regiment in November 2009. Prior to his assignment to the 2-23 Infantry, he served in both infantry and artillery battalions, most notably as a company fire support officer for 15 months during OIF-V. He is also a graduate of the Field Artillery Officer Basic Course at Fort Sill, Okla., the Infantry Maneuver Captains Career Course at Fort Benning, Ga., the Joint Firepower Control Course and the Information Operations, Capabilities, Applications, and Procedures Course, both while stationed at Schofield Barracks, HI.

SFC Robert A. Kaufmann currently serves as the battalion fire support and effects NCOIC for 2nd Battalion, 23rd Infantry Regiment. He has more than 14 years of fire support experience ranging from forward observer to strategic level targeting NCO. He has deployed to both Kosovo and Iraq in support of Operation Iraqi Freedom. He has also completed the Primary Leader Development Course, Basic Non-Commissioned Officer Course, the Joint Firepower Control Course, and the Joint Air Tasking Order Processing Course.

1st Battalion, 10th Field

Lessons Learned from

A Soldier from Battery L, 2nd Squadron, 3rd Armored Cavalry Regiment, leads Iraqi army soldiers in a squad drill. Soldiers from 3rd Armored Cavalry Regiment, w
Battalion, 10th Field Artillery last year, worked with local IA on basic squad and platoon level exercises to improve their cohesion and readiness. (Photo by SSG Garre

Artillery returns from Iraq: 'advise and assist' mission

who were deployed with the 1st
ett Ralston, U.S. Army)

By Sharon McBride
Editor-in-Chief

1st Battalion, 10th Field Artillery, The Rock's Support, from Fort Benning, Ga., deployed as part of the 3rd Brigade, Sledgehammer, 3rd Infantry Division to contingency operating base Delta, Wasit province last year. The Sledgehammer Brigade deployed as one of the first 'advise and assist' brigades in Iraq, and in support of this effort, the 1-10 FA transformed into a motorized task force and conducted partner operations in support of Iraqi security forces.

The battalion commander, LTC Shaun Tooke, visited Fort Sill in March to provide lessons learned from the deployment to the Fires Center of Excellence for future use.

Advise and assist. In an effort to strengthen Iraq sovereignty, stability and self-reliance,the battalion conducted operations that involved pairing stability transition teams with an associated battery or company to advise, train and assist their ISF partners. The goal was to help create and sustain a professional force capable of neutralizing violent extremist networks and providing sustainable security for the Iraqi populace, explained Tooke.

The battalion's organization and partnerships included, Alpha Battery, 1-10 FA, *Automatic Steel* and STT 12 working with the Wasit federal police brigade; Golf Company, 203rd Forward Support Company, *Spartans*, and STT 13 working with the 8th Iraqi Army Divisional Transportation Directorate; an operationally controlled military police company *Vikings* and STT 14 working with the Wasit Iraqi police; and Bravo Battery, 1-10 FA, *Raging Bulls*, providing support to the provincial reconstruction team.

In addition to 1-10 FA, the brigade's cavalry squadron, 3-1 Calvary operated from COB Delta and conducted advise and assist missions with the Iraqi army and the Iraqi border units along the Iraq/Iran border in Wasit province.

Task Force 1-10 FA also supported Iraqi national elections held in March. In collaboration with 3-1 CAV, the ISF, and the PRT, the battalion advised and assisted with the election security plan. The result was an extremely successful and credible election with no incidents, said Tooke.

Civil capacity was another major effort conducted with partners in the PRT and enabled by Bravo, 1-10 FA. The *Raging Bulls* provided movement planning, support and security to the PRT as they worked to facilitate efforts with business and agricultural development, social and essential services, governance and rule of law. The battery logged thousands of miles in support of the PRT's efforts to advise, assist and train provincial government agencies, plan projects in support of essential services and agriculture initiatives, and conduct post-project assessments.

Here are some key lessons learned by the battalion.

"One of our concerns was making sure all our Soldiers – especially those who had previously deployed to Iraq understood the current deployment, OIF VII, was not the same as OIF V," Tooke said.

All the battalion's training was nested with the brigade's. COL Peter Jones, commander of 3rd Heavy Brigade Combat Team, 3rd Infantry Division, understood the changing environment in Iraq and designed the pre-deployment training accordingly, said Tooke.

"Units continued to train on small unit combat operations to build proficiency and confidence

An Iraqi army soldier gives a hand signal to move his squad forward during a training exercise. Soldiers with 3rd Armored Cavalry Regiment and 1st Battalion, 10th Field Artillery provided assistance last year in training the IA on basic squad and platoon level skills. (Photo by SSG Garrett Ralston, U.S. Army)

among small unit leaders and Soldiers while continuing to emphasize that we had a different mission than previous deployments, which involved the ISF in the lead," Tooke said. "Our guys knew what the expectations were going in and for those who had deployed before, they understood that U.S. led combat operations were over," said Tooke.

Best practices for civil capacity with the PRT. These included:

- Small, easily executable and sustainable projects through the use of micro-grants were the most successful initiatives.
- Realistic goals, objectives and expectations were published in a unified command plan that everyone had access to. Treat this similar to training guidance or QTBs to keep the plan on course and resourced.
- Incorporate PRT principals in civil capacity working group.
- Creation of an S9 and imbed him/her with the PRT.
- Conducting quarterly PRT conferences at the brigade level.
- Creation of a cooperative environment by creating a data base of 'off the shelf projects.' These projects should be easy to replicate with minimum effort.
- Ensure to review additional funding requirements to sustain projects in the form of operating and maintenance expenses. Use these as a means to have your partner bring a financial plan to the table to share in the cost and to ensure the projects will be sustained over time.

Standards and discipline. Under normal circumstances, standards and discipline are paramount in a unit, Tooke said, but while deployed in an 'advise and assist' role it took on a more amplified meaning.

"Our Iraqi partners definitely were looking and paying attention to what every U.S. Army Soldier (from junior enlisted to senior officer) did and said," said Tooke. "So it became really important for us not only to maintain standards and discipline for ourselves, but to lead by example for the benefit of our Iraqi counterparts because in many cases they would emulate our Soldiers."

Tooke said leading by example was as simple as wearing the Army uniform properly or more complex actions such as promoting teamwork. For example, Tooke said when they first arrived, an obvious lack of trust and team work among ISF leadership was identified.

"LTC Chris Kennedy, 3-1 CAV squadron commander, and I established a cooperative environment amongst our two units and leveraged one another in support of our respective missions and partners," Tooke said. " In doing so, we ensured to include

Soldiers from 1st Battalion, 10th Field Artillery escort Dr. Hafid Al Daffaee, health advisor for Wasit Provincial Reconstruction Team, to a local hospital to assess the equipment and training needs of the facility in Kut, Iraq, Jan. 20. The assessment was part of the ongoing program to increase the medical infrastructure of the Wasit province. (U.S. Army photo by SSG Brien Vorhees, U.S. Army)

one another in a variety of efforts and by demonstrating our cooperation and teamwork to our ISF leaders it did not take long for them to establish similar relationships, begin trusting one another more, and work as a team.

Ability vs. rank. "Military forces around the world approach rank and prestige in completely (different) ways," states FM 3-07.1, Security Force Assistance. "In some cultures, rank equals experience; in others, it is nobility or education. Often many militaries have rewarded loyalty with promotions, which results in rank-heavy armies. Some FSF recognize talent, while others recognize rank. Advisors likely advise counterparts much more senior in rank. They must understand that rank on the uniform is important to many armies."

"In terms of how our partners's viewed U.S. rank, our experience showed that while on the surface the rank may be important, at the end of the day it's more about talent, trust, and ability to gain access to your partner in order to establish a relationship.," Tooke said. "With the departure of military training teams and arrival of STTs and the number of (U.S. Army lieutenant colonels) all engaging with key ISF leaders, it was important to communicate the resources and capabilities to our partners as well as how to request assistance.

"As commanders, LTC Kennedy and I met with our respective ISF key leaders and addressed our organizations, missions, and how the STTs and our subordinate units would support them," he said. "This allowed them to understand our role as commanders as well empowered the STTs to be the primary interface with which to coordinate support and training requirements.

Understand who the Iraqi stakeholders are. "Performing an 'advise and assist' mission involves various stakeholders which starts with your partner but also includes their respective Soldiers or police, the local government, and populace," Tooke said. When developing plans and operations, you have to ensure you're looking through the lens of your partners' vision.

"You might come to the table with 'good ideas' but if your partner is not interested in it – you have got to be prepared to adjust accordingly," he explained. In developing priorities be sure to understand your partners and be willing to tie yourself to their plan and how you can best support it, he added.

Focusing resources. Another takeaway for the unit was focusing in areas where resources are readily available.

"As we progressed through the deployment, we would experience additional requirements without additional resources," he explained. "In addition to partnering with a variety of ISF organizations, we all had a requirement to reduce our footprint as it related to excess equipment and containers."

This was a major effort in support of the reduction of force and transition, he added. Simultaneously, non-organic units began to redeploy, and some were not replaced in theater.

"We were fortunate to receive an MP platoon to replace the MP company that redeployed," he said. "But this was a major reduction in resources in support of our Iraqi police partnership and training.

It did show us, we had to be willing to adjust priorities, reassess task organization and make the necessary changes while incorporating our partners' priorities. As a result, we were able to continue to support the Iraqi police at the provincial level and to some degree the district level. Sometimes you have to do less, with less."

Local IA soldiers practice squad and platoon level exercises aimed at refining the basic skills they need to be an effective security force. (U.S. Army photo by SSG Garrett Ralston, U.S. Army)

Iraqi doctors fill out paperwork in the cardiac care unit during a Wasit Provincial Reconstruction Team visit to a local hospital to assess the equipment and training needs of the facility in Kut, Iraq, last year. The assessment was part of the ongoing program to increase the medical infrastructure of the province. (Photo by SSG Brien Vorhees, U.S. Army)

Consequence management. Each environment comes with different rules and/or procedures, but three specific areas that consequence management was focused the most in included the Security Force Agreement, understanding the medical rules of engagement, and social media, Tooke said.

Security Force Agreement. In 2008, the U.S. and the Republic of Iraq agreed on the terms of the withdrawal of United States Forces from Iraq and the organization of U.S. activities during its temporary presence in Iraq.

"We found there were a lot of interpretations on this agreement, which caused misunderstandings and friction with select Iraqi government leaders and local populace," Tooke said. To mitigate this, Tooke said he carried a copy of the Security Force Agreement in both English and Arabic. Anytime disagreements would arise, Tooke explained, he would pull out the copies and together, with his Iraqi counterpart, would look over the text.

"I would say, 'If we are in violation please show me where?'" he said. "Then I will take corrective training or action." Nine times out of ten, Tooke said, taking this direct approach would quickly settle disputes concerning the contents of the Security Force Agreement.

Medical Rules of Engagement. "During our train up, we did not focus on MEDROE or the impact it could have on sustaining relationships with our Iraqi partners," Tooke said. "With a combat support hospital on COB Delta, and the lack of capability or trust in the local medical system, it was rational to understand that our partners may attempt to bring Soldiers, police, and even family members to Delta for treatment.

"We had to manage our partners' expectations in understanding what we could and couldn't do from a medical perspective, and for the most part they understood," he said.

"However, there will be times when a severe accident/injury causes your partner to rely on you for assistance. Although, we would never turn someone away who was at risk of losing life, limb, or eyesight, leaders should expect to deal with borderline cases, and you have to be prepared to work through the constraints.

"We learned if something does not make sense; raise it to the chain of commands' attention sooner than later. Commanders need to have frank discussions about what is allowed and what will be allowed under an exception," Tooke said.

Always err on the side that would preserve the relationship with your partners, he added.

"The last thing you want is to undo months of work and get sent back to day one," Tooke said.

Social media. Tooke said he advocates all units to have a Facebook page, but it is imperative to pick the right person to update it and monitor the contents.

Facebook (www.facebook.com) is a website, which allows individuals to post profiles (photos and information) about themselves or about the unit in order to connect and share with other Soldiers, friends and family.

"Social media can be a great way to keep in touch with family members; however, it must be managed properly," Tooke said. For example, the last thing the chain of command wants is for family members to find out about a loved one's injuries or a death through an

Dr. Hafid Al Daffaee, health advisor for the Wasit Provincial Reconstruction Team speaks with an engineering student at a ceremony to present the findings of a Wasit province Public Works Assessment in Kut, Iraq, last year. The assessment, conducted over a year by members of the University of Baghdad, is the first completed in Iraq to this extent. (Photo by SSG Brien Vorhees, U.S. Army)

ill-placed Facebook post.

Operational security considerations should be at the forefront when managing posts by Soldiers and their family members, he said. It's always a good idea when using social media to avoid mentioning rank, unit locations, deployment dates, names, or equipment specifications and capabilities.

Unit training as well as family readiness group training is paramount; that way everyone knows what to or what not to post on the unit's social media sites prior to deployment, he said.

The best practice is for leaders to engage their Soldiers on social media use, prior to there being a problem. It is important to outline unit policy and make sure all Soldiers know what they can and cannot do when using various social media platforms prior to deployment.

On Feb. 26, 2010, the Department of Defense released Directive Type Memorandum 09-026, Responsible and Effective Use of Internet-based Capabilities.

This memorandum establishes DoD policy and assigns responsibilities for responsible and effective use of Internet-based capabilities, including social networking services. It also details when restrictions to social media sites can be put in place, due to bandwidth or security issues – but restrictions must be temporary and commensurate with the risk.

When in doubt, it's a good idea to check out the Office of the Chief of Public Affairs U.S. Army Social Media Handbook January 2011.

Combat complacency. Wasit province was a very permissive environment, Tooke said. Overall, the threat level was relatively low, and as a result 1-10 FA had to be extra vigilant about not letting complacency set in, he said.

One way to combat complacency is to continue to conduct recurring training on basic combat skills involving marksmanship, medical aid, and vehicle operations, he said. For example, while committed to the mission in Wasit, the unit remained vigilant in maintaining Soldier readiness and proficiency by training Soldiers on their individual and collective tasks, including Artillery Skills Proficiency Tests.

"Look for opportunities to train using resources on the base," Tooke said. "We had the luxury of a vehicle rollover trainer, aerial medevac company, and Special Forces team on COB Delta. Units would maintain proficiency while also incorporating their partnered Iraqi Army or police unit in the training. "We were also fortunate to be able to conduct a Table VIII field artillery live-fire event at the Bani Rabia range north of in Al Kut," he added.

The command sergeant major also played a vital role in maintaining Army customs, traditions, and events for Soldiers to take advantage of, he added. "The combination of MWR events, USO tours, sports tournaments, promotion boards, NCO and Soldier boards, NCO induction ceremonies, recognition lunches, and our traditional St. Barbara celebration all played a role in bringing the unit together outside of the daily missions, educate junior leaders, and decompress," Tooke said. "He also incorporated select Iraqi SGMs in some of these programs/events."1st Battalion, 10th Field Artillery redeployed to Fort Benning, Ga., in October 2010.

Wasit Provincial Reconstruction Team members speak with the hospital director during a visit, which was part of the ongoing program to increase the medical infrastructure, to assess the equipment and training needs of the facility in Kut, Iraq, last year. (Photo by SSG Brien Vorhees, U.S. Army)

Medical operations in counterinsurgency warfare:

desired effects and unintended consequences

By LTC Matthew S. Rice and LTC (P) Omar J. Jones

Medical operations are common in Iraq and Afghanistan, and the press reports about them frequently. Are they medically effective or are they harmful? Do they further the counterinsurgency fight, or hinder it? Other than press reports, not much published information about medical operations exists for reference when commanders and their staffs plan or execute such missions.

Brigade combat team and battalion commanders conducting counterinsurgency warfare often use their combat health support personnel and equipment for non-CHS purposes, namely to provide medical care to the civilians within their areas of responsibility. These operations have various doctrinal and non-doctrinal names, including medical civic action programs, combined medical engagements, or cooperative medical engagements, but they typically involve U.S. medical personnel at the battalion level, with or without the participation of indigenous medical personnel, providing care to civilians for a short period of time. For the purpose of clarity, we shall collectively refer to these missions as medical operations.

Commanders have one or more motives for conducting medical operations. These may include desires to be beneficent, to influence local civilians so the commander can gain an advantage over the insurgents, to gather intelligence, or to generate positive content for information operations. If the commander's motive is humanitarian, he must be aware of the capabilities and limitations of his medical assets, as they relate to the indigenous population, and he must be alert to the medical harm that may result from attempts to provide medical care. When gaining influence is the commander's motive, medical care essentially serves as a commodity, which the commander hopes to trade in return for good will or cooperation. When the gathering of intelligence is the commander's objective, medical care draws a permissive crowd, from which to elicit tactically useful information. When using medical operations as an information operation, the commander must ensure the appropriate media are present to carry the message to targeted audiences, rather than coalition media simply projecting the message back to coalition forces.

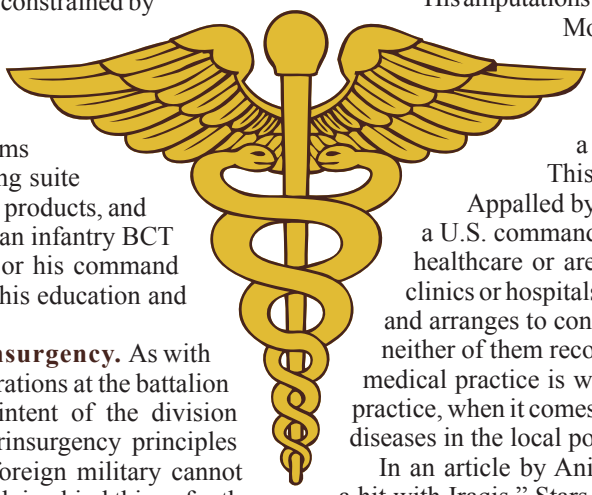
This article examines medical operations through the lens of counterinsurgency principles and seeks to determine if BCT and battalion medical assets can be effectively used for humanitarian, influence, intelligence-gathering, or information operation missions. We will examine the unintentional medical and tactical consequences of these missions, which can undermine higher-echelon commanders' operational and strategic counterinsurgency objectives, and suggest the most effective ways for commanders to employ their medical assets to further the counterinsurgency war.

Capabilities and limitations of medical assets. Brigade combat team and battalion-level CHS assets are tailored to provide a specific range of medical services, primary care and trauma stabilization, to a specific population, (healthy young Soldiers). Primary care within the BCT includes preventive medicine, the management of acute minor illnesses and injuries, such as colds, urinary tract infections, skin infections, sprains, lacerations, and simple fractures, and the management of chronic minor conditions, such as high blood pressure, lower back pain, and allergies. Family physicians, internal medicine physicians, pediatricians, physician assistants, and family nurse practitioners usually provide these services. Successful treatment of chronic, long-term, illnesses requires ongoing care,

Left: SPC. Chad E. Brown, a 1st Battalion, 4th Infantry Regiment combat medic from Red Oak, Texas, examines a boy's infected wound during a dismounted patrol to a village in the Deh Chopan district in the Zabul province of Afghanistan. (Photo by SPC Elisebet Freeburg, U.S. Army)

and preferably continuity of care, which is accomplished when the same physician treats a patient over a long time, or when different physicians treating a patient have access to their medical record for reference and for generating new entries. This is important. Physicians cannot effectively treat a patient's chronic illnesses, such as diabetes, hypertension, or emphysema, with a one-time encounter when no medical record exists for reference, and the treatment generates no medical record for future reference.

A deployed BCT may have one or more 'professional filler system' physicians attached. These physicians may not be primary care physicians, but medical specialists or subspecialists, such as cardiologists, dermatologists, or endocrinologists. However, despite their specialized skills and knowledge, without the support of trained assistants, sophisticated laboratory facilities, and specialized equipment, they are not able to function much beyond the role of a primary care physician. Their potential is constrained by their environment. For example, a trauma surgeon inside an evacuation vehicle is no more useful to an injured Soldier than a well-trained and equipped combat medic. The trauma surgeon only performs to his potential when he is in an operating suite with assistants, anesthesia support, blood products, and an intensive-care recovery room, just as an infantry BCT commander without his staff, Soldiers, or his command and control systems is, notwithstanding his education and experience, no more than a riflemen.



Medical operations in counterinsurgency. As with any military mission, medical operations at the battalion or BCT level should nest within the intent of the division and corps, so that they support counterinsurgency principles and imperatives. Most would agree a foreign military cannot succeed in counterinsurgency by simply doing kind things for the population. A common term for medical operations is 'random acts of kindness,' implying they create no sustainable gain, are not laterally synchronized, and are not nested with strategic plans.

To succeed, foreign military and host nation forces must cause the population to respect and rely upon the native government. It is necessary for the people to either fear the government more than they fear the insurgents, or to trust the government to protect them from the insurgents. Our use of the word 'fear' does not mean we endorse brutality. We are simply saying the population must fear the legitimate lethal and non-lethal martial and civil consequences of passively or actively supporting insurgents. U.S. forces may mistakenly engage in efforts designed to make Iraqis or Afghans like Americans, rather than making them stakeholders in their own government institutions.

After one BCT's assessment of an Iraqi hospital in 2008, during which the hospital director requested 30,000 liters of fuel to run his generators, despite admitting his fuel tanks were pilfered nightly, the BCT surgeon discussed the request with another medical officer.

"Americans have been giving him fuel for years. We must stop, or he will never force his own system to work," the surgeon said. "But if I give him fuel," said the other officer, "then I will be his hero." Of course, the objective is not to be the hospital director's hero, but make the hospital director more reliant on his own government for diesel deliveries or electrical power.

This problem of fostering an unhealthy reliance on U.S. resources is not unique to medical operations. A 2008 article by Dana Hedgpeth and Sarah Cohen, "Money as a Weapon," in the Washington Post reported the following, "In a Senate hearing this spring, [U.S. Senator] Levin recalled a recent trip to a base near Diyala . . . [A] senior U.S. military officer told him of a successful garbage collection program, paid for with [U.S.] money, and the thanks he received from an Iraqi official, who added, 'As long as you are willing to pay for the cleanup, why should we?'"

In general, we should conduct medical operations only if they are likely to cause the local population to become more reliant on and confident in their indigenous medical institutions, supporting the strategic counterinsurgency goal of legitimizing the native government.

The humanitarian medical operation: unnecessary, futile, or both? In Khidr, Iraq, an old woman wailed crazily as a man whose legs were blown off months ago was wheeled past the concertina wire. Hundreds of people lined up amid mud and rubble for a medical clinic held by American troops in this rural village northwest of Iskandariyah.

"I'm not going to be able to treat him," dermatologist LTC Tim Monahan said quietly, standing in the doorway of a dimly lit classroom. His amputations appeared to be healing well. The best thing, Monahan told him, was to wash with soap and hot water, but the man wanted medicine. After some negotiations, he left for the rubble with four tubes of ointment and a bottle of betadine [antiseptic].

This scenario is an easy trap to fall into. Appalled by the condition of local medical facilities, a U.S. commander believes the people have no access to healthcare or are afraid to cross sectarian boundaries to clinics or hospitals. He talks to a local sheikh or tribal leader and arranges to conduct a medical operation. Unfortunately, neither of them recognizes that transient battalion aid station medical practice is worse than consistent indigenous medical practice, when it comes to the diagnosis and treatment of chronic diseases in the local population.

In an article by Anita Powell, "Medical clinics in Baghdad a hit with Iraqis," Stars and Stripes Mideast Edition, MAJ Greg Brewer, chief medical planner for Multinational Division-Baghdad, put it this way: "To me it makes more sense for us to be aiding and assisting the Ministry of Health, rather than to be doing their job for them [with mediocrity]."

Consider the validity of some assumptions we may make when considering a medical operation. One is the indigenous people have little or no access to healthcare. This may be true in some sparsely populated areas, but this is of little relevance to the medical assets within a BCT, for reasons that we will discuss later, and may be a false assumption. One medical officer participated in an operation in a rural area outside of Taji, Iraq, where people who reportedly had no access to medical care appeared with the recent results of sophisticated laboratory tests, ultrasound reports, tissue pathology reports and computerized axial tomography scan images. Colleagues have described similar experiences in rural areas of the Diyala province. We should recognize, although we may not be familiar with the capabilities or locations of all the indigenous physicians or medical facilities in the area, the locals are. We are prone to project our unawareness onto the local population, allowing them to capitalize on our ignorance or sympathies to obtain services, which they – incorrectly – perceive as valuable.

Another assumption, at least in Iraq, is that people are too fearful to cross boundaries to obtain medical care. However, is this fear rational? According to a Los Angeles Times, article "War's Iraqi Death Toll Tops 50,000," by Louis Roug and Doug Smith, 2,155

Iraqis died violently in Baghdad in May 2006, at the height of the insurgency. (This number includes insurgents killed by coalition forces.) If the population of Baghdad was 5.5 million at the time, then the annual violent death rate was only 0.47 percent (470 per 100,000 per year). Although ten times higher than Detroit's annual murder rate (47 per 100,000 per year, according to the Federal Bureau of Investigation's 2007 Uniform Crime Reports Database), does a daily death-risk of 0.0013 percent (1.3 per 100,000 per day) really justify avoiding the market or a hospital? U.S. forces should not reinforce enemy propaganda by accommodating the population's fears. Rather, they should work to dispel those fears and to encourage normalcy as much as possible.

Before a battalion or BCT commander directs his medical assets to provide care to a civilian population, he and his medical officers must determine what common diseases exist in the community and whether CHS personnel and equipment can feasibly address those problems.

On any given day, less than two to three percent of people have an acute (brief and/or sudden) minor illness or injury that is amenable to diagnosis and treatment by a medical platoon or company. Many acute conditions resolve spontaneously and do not require treatment. The vast majority of people are either relatively well or have chronic illnesses, so the deployment of BCT or battalion medical assets to attempt the diagnosis and treatment of acute medical problems is largely unnecessary.

According to a 2007 report by Ross DeVol and Armen Bedroussian, "An Unhealthy America: The Economic Burden of Chronic Disease," the most common chronic medical conditions in the United States are diabetes, hypertension, arthritis, emphysema (from smoking), asthma, heart disease, cancers, and mental illnesses. These same chronic diseases are common among Iraqis.

In October and November of 2007, the United Nations Refugee Agency surveyed more than 700 Iraqi refugees living in Syria, and found that 17 percent of respondents had chronic diseases, the most common being hypertension, diabetes, heart problems, lung problems (emphysema and asthma) and arthritis.

Chronic illnesses are often preventable, largely self-inflicted by lifestyle choices, generally incurable, and progressively worsen with time. Dietary measures, exercise, tobacco cessation and consistent life-long medication use often slow disease progression. Since chronic illnesses require ongoing care, medical platoons or companies cannot effectively treat them in the local population. Consider the medical futility of this Baghdad operation: Consultations at the clinics are brief, often extremely so, and vital signs are rarely checked. Medics dispense a range of over-the-counter medicines and antibiotics, with no possibility of follow-up visits to gauge patients' progress.

Dr. (CPT) David Escobedo, a family practitioner from 1st Infantry Division, Schweinfurt, Germany, said he questions the medical value of the four-hour operations.

"These can't possibly make a long-term impact, since these are a one-time deal," he said during a September clinic in the Shi'ite neighborhood of Ur. "That's the biggest frustration. Not being able to see these people again and follow up." Another frustration, he said, is his inability to use laboratory tests to diagnose patients, or to provide more than basic help. Cases can be severe, as in the case of a tall, proud looking woman who carried in her 10-year-old son, a thin boy with severe deformities, club feet and atrophied limbs. She set him on an exam table and begged for help.

"There's nothing that we can do for him here," Escobedo said apologetically. "We can give him some vitamins."

Despite the futility and frustration illustrated above, the typical medical operation consists of battalion medical personnel setting up a temporary 'sick-call' clinic in a school or other building, where a large number of people, with mostly chronic illnesses and unrealistic expectations of cure, quickly overwhelm them. Many people are not sick at all, but only curious. Severe time constraints, lack of sufficient interpreters, and absence of basic diagnostic equipment such as laboratory tests and x-ray imaging compound these frustrations. The reader will appreciate the futility of this healthcare model if he imagines having chest pain, a cough, or bloody urine; tries to explain his symptoms to a foreign physician, who speaks no English, but only has one shared and harried interpreter; imagines the physician performing a physical exam, correctly diagnosing the problem, without any diagnostic equipment, and then imagines him formulating an effective treatment plan — all within three minutes.

It may be counterintuitive, but the most effective means to improve civilian health are nonmedical. The means are ensuring security, dispelling fear caused by insurgent propaganda, and subtly assisting local authorities with clinic or hospital infrastructure repair or development. These actions should facilitate freedom of movement of patients, physicians, and medical supplies. Physicians who feel secure will naturally want to work at their clinics or hospitals, and if they are getting paid, will probably encourage their expatriate colleagues to return home. Truck drivers who feel safe will be more likely to arrive at hospitals with supplies and medications. People who feel secure will be more likely to travel to a local clinic.

Dr. Abbas al-Sahan, quoted in a Washington Times article by Rebecca Santana, "Botox in Bagdad? Iraqis go for a little nip, tuck," validates this assertion by saying, "When there's a good security situation and good economic improvement of the country, the work will grow," describing the increasing demand for cosmetic surgery in Iraq, and the return of physicians who had left due to fear of violence.

If the commander treats the underlying disease, insecurity and restricted movement, then the symptom, poor access to healthcare, or poor health, will improve naturally. These actions have a greater chance of sustainably, improving the health of Iraqis or Afghans, than do any number of operations, in which U.S. forces, provide transient, poor-quality medical services.

A typical humanitarian medical operation, although relatively easy to execute, is an exercise in futility. Senior commanders have prohibited U.S. military physicians from providing any but emergent care (life, limb, or eyesight) to civilians, but as abundant media reports indicate, well-intentioned but misguided subordinates routinely violate the prohibitions.

First, do no harm. We can apply the medical principle of 'do no harm' in a military context — tactical, operational, or strategic. Just as physicians consider the potential harm of interventions and medications they prescribe, combat commanders consider the second- and third-order effects of their operations, including unintended negative consequences. Medical operations are a morass of well-intentioned mistakes, ranging from medical harms to strategic errors. Commanders and their medical advisors must deliberate carefully and mitigate the likely adverse outcomes of medical operations, if they choose to execute them at all.

The likelihood of causing medical harm during these operations is high. The combination of an overwhelming number of civilians, usually in the hundreds, a small number of physicians or physician assistants, usually one or two, the short duration of the operation, usually four to six hours, the absence of minimal diagnostic equipment, and language and cultural barriers are a recipe for disaster.

Once engaged in the operation, there is tremendous pressure — to do something — even if it is not helpful and is potentially harmful. We dispense pain medications and antibiotics without restraint. Do we ever learn of the child for whom we unnecessarily prescribed antibiotics for a viral cough, and who suffered a serious allergic reaction because we were unaware of her penicillin allergy? Do we hear

about the woman we gave acetaminophen to for hip pain, who developed liver failure because we were unaware of her chronic liver disease? What about the man who complained of rectal bleeding, left the clinic with a tube of hemorrhoid cream and a false sense of reassurance, and was later diagnosed with colon cancer, by then incurably metastasized? How about the mother who gave her feverish child too much ibuprofen because of an error in calculating the weight-based dose, causing the child's kidneys to fail; or the man who developed severe infectious colitis after being given an unnecessary antibiotic for a cold?

These real medical errors occur in the U.S., so we can assume they occur during medical operations. However, due to the transient nature of medical operations, U.S. and allied local physicians rarely learn of the consequences of their well-intentioned efforts. In addition to the ethical questions raised by this type of medical practice, these medical harms can provide fuel for enemy propaganda, and foster mistrust of Americans, or worse, of involved indigenous physicians.

A U.S. Special Forces medic helps an Afghan boy by checking him for an ear infection in Uruzgan, Afghanistan. (Photo by SPC Nicholas T. Lloyd, U.S. Army)

Do expectations create suffering? Other cases were more severe. In a few heart-breaking instances, parents entered the rooms cradling crippled or blind children, their eyes pleading for a magic cure. Besides offering something for the pain, there was little the medics could do for patients with chronic, severe illnesses. As trained healers, it was something they all found frustrating.

The failure to meet unrealistic expectations is a common thread of medical operations. Iraqis or Afghans may believe they will benefit from superior medications, skills, or knowledge; or that Americans will cure their children of incurable diseases. Consider the amputee who left with a tube of ointment; or the desperate mother who brought in her severely deformed son, only to be given a vitamin.

Dozens of headlines in unit newspapers or Stars and Stripes proclaim the "success" of one medical operation or another, in which, "U.S. physicians provide medical care to 400 Iraqis," in three hours. They tout quantity but do not mention quality. Commanders should read between the lines to consider the tactical consequences of people leaving these operations disillusioned, disappointed, or angry, their expectations of miracle cures, wonder drugs, or Learjet trips to the Mayo Clinic unfulfilled. Their disappointment can foment anger and incite behavior that is more malignant.

To avoid creating disappointment and potential backlash, commanders and their medical officers should set appropriate, low expectations in advance of medical operations, outlining what their medical team will and (more importantly) will not do. For example, a commander could tell a community leader, "My Soldiers will distribute dental floss, toothpaste, and toothbrushes; and will provide education on the prevention of tooth decay and gum disease. They cannot and will not attempt to diagnose or treat illnesses."

Competition with the indigenous clinics and hospitals: reducing the number of stakeholders. Military operations must not undermine the peoples' respect for, reliance on, or trust in their government institutions, including healthcare institutions, regardless of the institutions' state of dysfunction. Iraqis or Afghans who depend on their government institutions are less likely to enable destructive efforts against those institutions. Those who do not depend on their government for services are more likely to be ambivalent about or supportive of destructive efforts against those institutions. As GEN David Petraeus wrote in a 2006 Military Review article, "Learning Counterinsurgency: Observations from Soldiering in Iraq," increasing the number of stakeholders [emphasis added] is critical to success.

Medical operations establish parallel healthcare venues that compete with and delegitimize indigenous healthcare institutions and physicians, foster inappropriate dependence on U.S. assets, and discourage development of local resources. What messages are we sending when we establish a temporary clinic 10 kilometers from the Abu Ghraib Hospital?. "We have better medicine." "We do things better than your doctors." "You can't trust your hospital to take care of you." "It is not safe to drive to the hospital." The Khidr medical operation (referenced above) illustrates the problem of competing with legitimate hospitals. The attendees at that medical operation were "within traveling distance of seven [Iraqi] hospitals."

What is right versus what is easy. Most deployed U.S. physicians will encounter several civilians with tragic medical problems and may attempt to evacuate them to U.S. military hospitals. Some herald treatment of sensational and tragic cases as evidence of the success of a medical operation or use it to justify an exception to the medical rules of engagement. But doing so actually thwarts the redevelopment of indigenous medical professionals and institutions. While transient U.S. combat surgical hospital care will, at least temporarily, benefit the patient in question, local physicians cannot develop their practices if we stunt their progress by diverting their patients into our evacuation system.

When confronted with these heartbreaking situations, we must choose the 'hard right,' rather than the 'convenient or emotional wrong.' If pressed to provide care for a seriously ill civilian, we should induce or coerce local physicians to provide the best available indigenous care and only evacuate the civilian into the military system if we expect to gain a compelling tactical advantage by doing so.

Operations scrutiny. Brigade combat team and battalion medical personnel cannot effectively provide care to Iraqis or Afghans with chronic health problems, and on any given day, only a small percentage of people have acute minor illnesses or injuries requiring treatment. Attempts to provide diagnostic or curative medical services are likely

to cause medical harm. Yet, medical operations are prevalent and usually so popular with locals they are overwhelmed with 'patients.' The operations become medically meaningless in the process. They are attractive to locals because they are a novelty, and because locals incorrectly anticipate the receipt of a benefit. They are also opportunities to obtain free goods to sell in the black market.

But planners say the good will missions also suffer from serious flaws. Among them, a lack of medicines and diagnostic tools that would help get patients long-term care; and locals' tendencies to present false medical claims in order to get free medicines and goods.

"Vitamins are huge. We may as well toss them out the door. As long as they walk out of here with something, they're happy." That much was clear as Sadoon Karim, an Iraqi army medic, attended to patients during the mission in Ur. A woman walked in and, in insistent Arabic, pointed to an array of medications on the table, demanding, and receiving, eight different kinds of pills, creams and ointments. After she left, Karim looked at his pillaged selection of drugs and shrugged. "It's a hysteria disease here," he said in English. In another room, a healthy looking 23-year-old complained of a variety of ailments. "A lot of times, little kids will come in and say, 'We have arthritis,' they just want the pain medications. They don't have any problems. They just want to see what we've got."

Patients, for the most part, admit to that, "I don't go to the government hospital," Salah said, his hands full of free medications. "They don't give me what I need." Another patient, who complained of diabetes, said he felt entitled to free medical care. "When we go to the hospital, we have to pay money," he said. Near the end of the mission, civil affairs Soldiers exasperatedly tried to stop women from carrying out entire boxes of clothing, food, and school supplies. The caretaker of the school, in which the mission was held, complained that patients made off with school property. After the mission, members of the civil affairs unit gathered in their office at Forward Operating Base Loyalty and vented their frustration at the government's lack of participation, at patients' greediness and disorderliness, at the insufficiency of supplies and at the difficulty in winning trust in the course of a four-hour clinic. It was CPT Bill Billeter who pointed out the bright side. "I don't know how well we showed people that the government of Iraq cares about its people," he said. "But we showed we cared."

Sgt. Heather Blake listens to the heartbeat of a small boy at the free clinic at Bagram Airfield's Korean Hospital. Medical personnel from Afghanistan, Korea, United Arab Emirates, the U.S. Army and Army Reserves and U.S. Navy treated more than 200 patients. (Photo by SGT Katryn McCalment, U.S. Army)

This operation does not survive even a cursory course-of-action vetting process. The mission failed to improve civilian health in any significant way and probably harmed some people with inappropriate medications. The participants attempted to provide care for people with chronic illnesses, which is impossible. It created competition with the local hospitals, delegitimizing them. The woman with the deformed child certainly left disappointed: is it unreasonable to consider that such disillusionment may turn an uncommitted civilian toward the arms of insurgents? As reported, this operation's only redeeming quality was that it felt good to one of the participants, and pictures of it made nice slides in a command briefing.

A brief look at the numbers reveals the medical absurdity of the operation: 200 patients, four hours, one U.S. physician, one Iraqi medic, and several U.S. medics. At 50 patients per hour, the physician 'evaluated' one patient every 1.2 minutes. Predictably, the operation rapidly degenerated into chaos, a free-for-all dispensing of unnecessary and potentially harmful medications, and even outright thievery.

If the commander's intent was, in part, to improve health, or to improve access to medical care in a Baghdad neighborhood, then what effective actions could his medical officer or planner have recommended? First, he should have counseled against any attempts to provide diagnostic or curative medical services. Provision of preventive services, such as vaccination against childhood illnesses, educational programs regarding tobacco cessation, or hygienic and sanitation instruction directed at infectious disease prevention are medically sound and relatively benign. Identifying nearby open clinics and hospitals and marketing their hours and capabilities may be useful. Ensuring or providing safe passage of patients from their neighborhood to the clinics or hospitals and back may be helpful.

Note the Americans' frustration that the Iraqi government (Ministry of Health) would not participate in this Baghdad operation. One cannot really blame the Iraqis. Adding Iraqi physicians, to a futile model of medical care, does not improve it, and may cause local physicians to think American physicians are incompetent. It would be irrational for an Iraqi or Afghan physician to leave his relatively productive medical practice to spend six hours distributing vitamins and painkillers to a horde of people who may or may not have any medical problems and whom he probably will never see again.

Medical operations are of dubious medical value, undermine efforts to build institutions, and explicitly violate medical rules of engagement, yet they are prevalent. This may be because they are relatively easy to execute, brief well to medically-naïve superiors, are emotionally gratifying for some restless doctors and medics, and generate positive press for self-consumption. Most likely, though, humanitarian medical operations are prevalent because commanders and their medical advisors incorrectly assume that BCT medical assets can effectively address indigenous medical problems.

While it is important for U.S. forces to engage the local population to create or maintain a deterrent presence and to develop cooperative relationships, doing so with a temporary 'sick call' clinic is a mistake. Insecure civilians need a dedicated security presence in their communities. Providing security is a distinctive competency of a combat arms battalion commander and his Soldiers, whereas providing primary medical care to Iraqis or Afghans is not.

Using medicine to gain influence. Most commanders probably do not engage in medical operations solely with humanitarian intent, but rather use the operation as a vehicle with which to engage the local population, to gain influence (wasta), and otherwise to 'win hearts and minds.' But we must acknowledge that using medical operations for these purposes is really nothing

"I don't know how well we showed people that the government of Iraq cares about its people, but we showed we cared."

more than exchanging a commodity, the illusion of medical care, for cooperation or influence because meaningful medical care is not usually provided. Unlike Hamas, which can successfully garner popular support by providing social services including healthcare, U.S. forces in Iraq and Afghanistan, alien and without the intent or desire to remain indefinitely, cannot effectively do so. The Ur operation described previously sought to generate good will in Baghdad by exchanging the illusion of healthcare for cooperation and cessation of violent behavior. This construct may be naïve. A committed religious fanatic or tribal or sectarian insurgent is not likely to change his behavior because an American doctor and Iraqi collaborator gave him a tube of ointment, or his mother a bottle of ibuprofen. An ambivalent civilian who receives a one-month supply of diabetes medication is not likely to flip to the government side so long as he feels the insurgent's eye on him and continues to receive night-letters reminding him of the consequences to his family should he cooperate with the infidels. 'Random acts of kindness,' if they are effective at all in modifying behavior, which is doubtful, are certainly not effective in the absence of security.

Counterinsurgents can purchase influence over ambivalent civilians with money. After all, we paid the Sons of Iraq with cash, not with medications. The price of cooperation is relative to the level of risk the civilian is willing to accept for associating with U.S. forces or the host-nation government. The higher the risk; the higher the price. Considering the medical and operational harms inherent to medical operations, would it perhaps be better to exchange a more benign commodity for influence? Anything of perceived value would likely do: cash, livestock, food, fuel, or potable water.

The use of medicine to gather intelligence. Commanders may conduct medical operations, in part to draw a crowd of permissive or friendly civilians from which to elicit tactically actionable information or to determine general attitudes, such as opinions about the legitimate government, the perception of security, or feelings about coalition forces. In this situation, the illusion of medical care is bait. Considering the pitfalls of medical operations, using an alternative commodity to entice civilians would be preferable and equally as effective.

Using medicine for information operations. When commanders use medical operations to generate positive content for information operations, they must overcome several obstacles. One is the mitigation of unintended consequences, both medical and tactical. The commander must determine how to conduct the operation without causing undue medical harm, without causing disappointment, without undermining the local health care system, and without otherwise countermanding counterinsurgency efforts.

Second, for the information operation to be effective, the commander must have the media present at the operation to project the message to the targeted local, national, or regional Islamic audience (e.g., Al Jazeera, Iraq Daily, Kabul Weekly, Bakhtar News Agency). Stars and Stripes, Combat Camera, and writers for division or corps news bulletins do not reach the target audience, unless we are performing for ourselves.

The way ahead. In general, battalion and BCT medical forces should not attempt to provide diagnostic and curative medical care to civilians, except in emergencies or in situations in which U.S. forces inadvertently caused the injury. Regardless of the commander's motives, using the illusion of healthcare to engage the local population risks causing medical harm to those he intends to help, and perhaps more significantly, risks making tactical errors that are likely to undermine counterinsurgency strategy.

A commander can most effectively improve the health of civilians in his area of responsibility by treating the disease of insecurity rather than attempting to treat its symptoms. He can do so by improving real and perceived safety, dispelling fears caused by insurgent propaganda, and increasing freedom of movement.

If a commander does employ his forces to provide medical care to civilians, the least medically harmful means is preventive medicine. If he does choose to use his medical personnel to attempt diagnostic and curative medicine, he should have feasible and acceptable, for the indigenous people, contingencies available to address, the majority, who will present with chronic diseases or serious conditions.

Commanders and their medical advisors should not attempt to improve medical operations by adding indigenous physicians or medics, to this unsustainable model of medical care. Doing so makes U.S. medical personnel appear incompetent in the eyes of our allies and draws valuable native medical resources away from productive use into a sinkhole of futility.

Commanders and their medical officers should avoid the temptation to divert tragic humanitarian cases into the U.S. evacuation system, in an attempt to obtain temporary U.S.-standard medical care for them. Rather, when asked to intervene, they should work with officials in the indigenous medical system to get the person the best available indigenous care, although the outcome may not be ideal from an American's perspective.

What are some roles, other than providing combat health support, in which medical staff can be useful to their commanders? Medical officers can act as effective subject matter experts to their civil affairs colleagues who are responsible for the reconstruction of healthcare facilities and for planning public health campaigns. Medical officers and planners can benefit their local counterparts by offering training, establishing collegial relationships with them, and advising them on such issues as medical systems, staffing, and logistics. Medical officers should establish relationships with local clinic and hospital directors and facilitate meetings with their counterparts at the ministry level, with the aim of facilitating institutional development. Attending these meetings to help negotiate conflicts or find solutions to problems can be useful as a way to keep a finger on the pulse of the indigenous medical system.

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A global missile
Terrestrial high-energy

By Howard Kleinberg

Space-based lasers. SBLs are another missile-defense technology and basing concept that originated in the SDI era. While no systems were ever readied for testing, the 'HEL-aloft' concept also has the advantage of an additional 20 to 30 years' worth of research and development since that time, a time-span that has brought the High Energy Lasers missile defense weapon to the brink of fruition, as illustrated by the first successful double-shoot down test of the megawatt-class airborne laser test bed, to date.

Breakthrough technologies typically take three to four decades to mature; for example, the silicon semiconducting transistor was first invented in the 1940s, but didn't reach mainstream applications until the early 1980s, some 40 years later. This is also proving to be the case with laser weapons. The first successful tests proving the viability of a laser weapon were achieved with the Airborne Laser Laboratory in the 1970s and 1980s. With the more recent, and numerous, test successes of the joint U.S.-Israeli laser weapon prototype, alongside the latest successful ballistic missile shoot-down test of the ALTB to date, the advent of high-energy laser weapons for air and space applications is near. While development of SBLs have been on hold for many years, development of its Airborne Laser Test Bed counterpart will prove highly beneficial in enabling highly-mobile, BMD-capable High Energy Laser generation, aiming and beam-control technologies, and also gain much-needed political credibility to this oftentimes virulently-opposed approach.

However, while chemical lasers represent the most achievable near-term technology, they suffer from a great many problems, such as limited amounts of onboard laser-fuel 'ammunition,' a problem that severely limits the overall effectiveness of SBLs. In addition, these chemicals are oftentimes toxic, and burn or react at very high temperatures to generate their high-energy beams of laser light.

These reactions also generate immense amounts of heat, requiring long cool-down times for the laser generation system. Further, unlike the ALTB, which can be rearmed on the ground (by replenishing its laser-fuel) for multiple missions, the useful service life of a space-based chemical-laser weapon system would be limited to the single laser-fuel load it can carry within it into space, a limitation as few as 75 shots.

This problem could be alleviated with the development of an autonomous on-orbit replenishment system, as proposed for development in DARPA's Orbital Express on-orbit replenishment program. However, even with this orbital replenishment/repair system in place (i.e. orbit) it would still take time (weeks or months) to prepare and launch missions to refuel the SBLs, time-scales that a large-scale attack might preclude. It would also require launching large quantities of laser fuel into orbit, an extremely expensive operation to maintain, though this would still be far less expensive than replacing the SBLs themselves outright, given the relative masses involved.

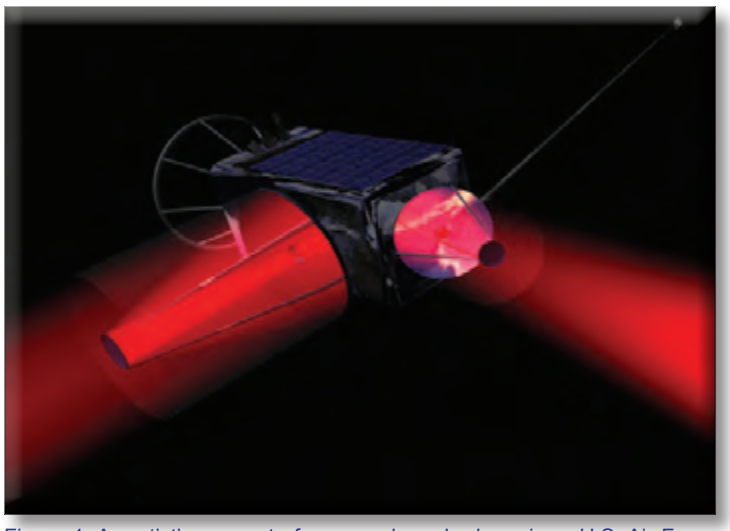

Figure 1: An artist's concept of a space-based relay mirror. U.S. Air Force researchers are working on technologies that use mirrors in space to relay laser energy from one location to another. (Image courtesy of The Air Force Research Laboratory Directed Energy Directorate)

Finally, the replenishment spacecraft themselves would become targets of enemy ground-attack and ASAT operations in wartime, since they would constitute critical supply lines of communication to the SBLs. Ideally, then, an easily-replenished, cheaply-operated, easily-replaced, and somehow unlimited-ammunition SBL is desired; the question then becomes how to achieve this level of capability.

The answer to the problem of self-replenishing, lower-cost, High Energy Laser weapons in space may well start with rapidly-maturing solid-state lasers. SSLs are superior to chemical lasers in that they draw upon electricity for power. Their chief drawbacks are twofold: firstly, no such high-powered device can yet operate for sustained periods without overheating or cracking; and secondly, SSLs' power outputs have been much lower than their chemical-laser counterparts.

However, solutions to these problems are being found. One such example is Northrop-Grumman's joint high-power solid-state laser test-bed program, which ran for a sustained 350 seconds at 27kW of power, in November 2005. Another, and even more promising new technology is DARPA's High-Energy Liquid Laser Defense Systems program, which represents a profound potential breakthrough in SSLs, and with it, laser-weapon technology overall:

"For years, DARPA, the Pentagon's… research arm, has been bankrolling a project to cool a high-energy laser with a liquid that has the same angle of refraction as the mirrors inside the blaster. That way, the ray gun can fire away, even while it's being cooled. The weapon should take up a whole lot less room. And that could pave the way to putting a [weapon] "on a ground vehicle, a helicopter, a jet," according to Charles Manor, a spokesman for Lockheed Martin, which was recently named the weapon system integrator for this High Energy Liquid Laser Area Defense System project.

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lasers and aerospace mirrors

Part II of II

A scaled-up production version of HELLADS with an output on the order of megawatts could solve all of a HEL's limited-ammunition problems. Indeed, the ongoing rapid rates of improvement in SSL technology has led the U.S. DOD to consider reviving the High Energy Laser program based upon SSL technology, rather than the more problematic, limited-shots chemical weapon system previously tested; the very reasons for which it was ultimately cancelled.

The other challenge to implementing SSLs as the basis for SBLs returns to the problem of power; namely, where an equally-unlimited-supply of megawatt-levels of electrical power can be found for development into a space-based weapon platform. One potential solution is space-nuclear power: according to the University of Texas at Austin's Spacecraft Design Archive, by Talia Jurgens, "…solar dynamic generation is generally most attractive for power requirements between 20 kW and 100 kW. Larger needs are best met by large scale nuclear systems, and smaller needs are best met by solar photovoltaics, RTGs [Radioisotope Thermoelectric Generators – Ed.] or fuel cells."

Based on this evaluation, only space-based nuclear-power reactors would be capable generating electrical energy on the order of the megawatts needed to power an 'unlimited-ammunition' SSL-based SBL. NASA has proposed developing just such a space-capable nuclear power plant for its PROMETHEUS interplanetary-exploration vehicle. However, this program was cancelled due to its sheer complexity, putting off the prospects for a megawatt-level space-based nuclear power source for the foreseeable future. Indeed, the sheer size, complexity and cost for megawatt-class space-based energy sources of any kind, effectively preclude their deployment.

> Space-Based Laser Relay Mirrors may well prove to be the 'unsung heroes' of future BMD systems of any kind, regardless of the latter's basing modes.

For the foreseeable future, then, neither chemical nor solid-state HELs are practicable for space-based platforms. As cited previously, the IWG recommends that a force of 12 SBLs be deployed as part of an effective space-based BMD network. Interestingly, this is even less that the number originally proposed as the initial deployment for SDI's ultimate force of 20 SBLs to defend the CONUS against ballistic missile attacks. However, the projected cost for a deployed force of 20 SBLs is $81 billion, in FY2000 dollars. Given such possible factors as program cost overruns, inflation, and the like, the final price tag is likely to be far, far greater than $81 billion. The problem then becomes, if SBLs per se cannot be feasibly or affordably developed and lofted, how is the on-orbit 'global reach' HEL SB-BMD capability to be realized?

Rather than trying to put them in space, High Energy Lasers are best based in terrestrial platforms, where they can draw upon existing and available sources of sufficient power, and the greater carrying capacity (and lower costs) of terrestrial platforms, until the time comes when space-based electrical power generation technologies (and terrestrial domestic politics) catch up with the longer-term requirements for SBLs. Terrestrial HELs can also become as large as needed (within practical limits, of course), and could still be carried by terrestrial-based platforms. Finally, Terrestrial HELs would be readily and affordably replenishable, maintainable, and upgradeable, unlike on-orbit systems.

However, this leaves a glaring hole in the global-reach, boost-phase Space-Based High Energy Lasers defense element: namely, if there are no SBLs, how are the lasers to reach 'down' from space, to reach their boost-phase missile targets?

The answer to providing the Space Element of the Space-Based Laser 'system' lies not in deploying large numbers of prohibitively challenging SBLs into orbit, but rather, replacing them entirely with space-based mirrors. (See Figure 1 on page 30.)

Space-Based Laser Relay Mirrors may well prove to be the 'unsung heroes' of future BMD systems of any kind, regardless of the latter's basing modes. In principle, SBLRMs would enable all deployed HELs to be brought to bear in any theater of operations in the world at any time, eliminating their otherwise-limited line-of-sight ranges. Indeed, SBLRMs have a multitude of advantages over SBLs. First, given their much greater simplicity and much lighter weight, they would be far less expensive to build, launch and operate than SBLs, especially in large numbers. The nearest cost and operations model for a constellation of SBLRMs is that of the IRIDIUM communications satellite constellation (66), or that of Brilliant Pebbles weapons themselves, (from as few as 70, to as many as 295, or more.) Second, SBLRMs would be almost infinitely reusable and have de facto 'unlimited-ammunition', unlike the expendable, single-shot-per-unit kinetic-kill interceptors, or even the 75-shots-per-unit SBLs, since they would essentially be "just" mirrors, not emitters, sans expendable missiles or laser-fuel. Even their attitude control can be achieved via electrically-powered momentum wheels, which need no expendable fuel. Third, SBLRMs could also use reflected laser-energy for self-defense, provided either the SBLRMs themselves possessed sufficiently sophisticated sensors and avionics (which they would have to possess, in order to fulfill their BMD targeting mission,) or that the command and control infrastructure possessed sufficient situation awareness, and that HELs of any basing mode were available when needed. Fourth, SBLRMs could themselves provide additional 'eyes and ears' for the global missile defense surveillance and warning network. Fifth, SBLRMs could also provide 'escort' duty for SBI constellations, protecting them from ASATs, something no SBLs could afford to provide. Sixth, SBLRMs' vastly lower unit costs lend them to be producible in large numbers, and so, able to further benefit from economies of scale. Sixth, assuming SBLRMs comprise sufficiently compact launch-packages, they would be mass-deployable using Operationally Responsive Space launch

systems, for easy bolstering and replacement on orbit, especially during wartime. Finally, given that SBLRMs would be 'unarmed' and relatively 'cheap' satellites (especially compared with SBLs), their development and deployment would be far less politically controversial than any SBL.

Replace SBLs' HEL Element with Terrestrially-Based Mobile Lasers. The answer to providing the HEL source-energy element of the Space-Based Laser 'system' similarly lies not in lofting large numbers of prohibitively challenging SBLs into orbit, but rather, replacing them entirely with Terrestrially-Based Mobile Lasers. TBLs would be comprised of mobile ground-based lasers, or MGBLs, in conjunction with Airborne Lasers and Ship-, or Naval-Based Lasers. A TBL is not a space-based weapon per se, enabling it to avoid the usual 'space-weapon' objection. It is, nonetheless, not only capable of engaging in-theater ballistic missiles directly, but more importantly, it functions as the optimal HEL 'feeder system' portion of the greater missile-defense 'system of systems' to any SBLRMs, to engage boost-phase missiles over their launch sites worldwide.

Mobile Ground-Based Lasers. In this option, MGBLs would be comprised of Megawatt-class HELs deployed in ground-mobile configurations, mounted on trucks, tracked vehicles, or even railroad cars. Such a deployment would be an amalgamation of very much like the Cold-War-era MX mobile ICBM launcher. While it would perforce be smaller and thus less powerful than a fixed-site GBL, its ground-based design would nonetheless enable it to be larger and more powerful than even the already-highly-mobile, megawatt-class ALTB, never mind an SBL. The platform would be deployed along with any additional trucks or railcars needed to provide extra electrical power generation systems, laser fuel (if required), crew, and other support requirements. It could draw upon whichever laser technology provides the best, i.e. highest-power, most easily-powered and sustained-fire-capable MW-class output when built.

A mobile GBL has many advantages over its fixed counterpart. First, it could move and be concealed much more easily, complicating an adversary's attempts to find, evade or destroy it. Second, and also unlike a fixed-site GBL, it would be able to 'chase' firing-sites with good weather for optimal laser-firing conditions. Whenever applicable to combat operations, MGBL units could also be positioned to optimize missile-defense coverage to the expected threat. Third, other advantages of a MGBL fleet include the ability to quickly and affordably supply, repair, and upgrade existing platforms with new technologies as they evolve, at vastly lower cost than deploying new weapons or delivering upgrades to multiple on-orbit systems. Finally, it could even be affixed within or atop a large, ocean-going cargo vessel, from which it could either provide supplementary missile-defense fire to a seagoing fleet or force deployed ashore, or be delivered to an overseas theater of operations for theater missile defense operations there, also like the ALTB. Ultimately, then, MGBLs can provide globally-mobile, highly persistent BMD coverage (See Figure 2, left). Work on just such a weapon is currently well underway, in the form of the U.S. Army funding Boeing's development work on the truck-mounted High Energy Laser Technology Demonstrator (See Figure 3, below)

Figure 2: Speed-of-light weapons on the battlefield. Conceptual look at putting a solid-state laser on an armored ground combat vehicle for potential use in the U.S. military's Future Combat Systems Program. (Image by Northrop Grumman)

Figure 3: An artist's concept of the High Energy Laser Technology Demonstrator. (Image courtesy of Boeing)

Another potential deployment mode for M-GBLs is by rail. Trains can transport a great deal more cargo than any individual truck, which might be a necessity for early generations of megawatt-class higher-energy lasers, such as is currently carried in the ALTB. While 'tied' to railroad tracks, and offering less mobility than all-terrain trucks, train basing still affords high mobility and access to wide areas of CONUS, at least, making them far more difficult to find and attack than fixed-site basing. Indeed, such a basing mode was considered for the MX ICBM program during the latter stages of the Cold War; this basing mode could also be considered for this new missile-defense mission

Ship-based, naval high-energy laser weapons. In addition to air- and land-based mobile HELs, naval vessels are yet another basing mode for HELs for missile defense. Indeed, they are already mobile, with over 70 percent of the Earth's surface to roam, they have far more 'terrain' to hide in than any land-based system; and they can remain at sea for months at a time, unlike manned aircraft. The U.S. Navy fully intends to develop and deploy HELs on its ships in the near term:

"The Navy expects to incorporate lasers onto most ship classes in its surface fleet, including amphibious ships, cruisers and destroyers. 'The continuing goal is to deploy ships with an appropriate weapons mix, possibly one day including directed energy weapons, to engage and defeat any potential adversary across the spectrum of naval warfare," said Rear Adm. Frank Pandolfe, Navy director of surface warfare.

Perhaps even more than for any other terrestrial laser basing platform, naval vessels have considerable internal space and ever-improving electrical power supplies with which to 'fuel' solid-state or other electrically-powered HELs. The U.S. Naval Sea Systems Command is currently conducting active evaluations of a ship-based laser weapon system, having recently completed a series of successful firing tests against unmanned aerial vehicle targets. The next step

Figure 4: Artist rendering of Lockheed Martin's High Altitude Airship. (Image courtesy of Lockheed Martin)

in this R&D process is to deploy a High Energy Laser in a ship for at-sea live-firing tests against small high-speed boats. While this systems is designed and being tested at the approximately 100KW level (the minimum needed for weapons capability), and is meant for ship self-defense, this is just a prototype, with considerable upgrading possible simply by bundling together more of the constituent 15KW optical-fiber beam-generating emitters (along with larger and more-capable mirrors, mountings, controls, etc.)

Once such a system is proven, the Navy intends to install it in most of its classes of ships, according to an article from the National Defense Magazine, "Navy Aiming for Laser Weapons at Sea," by Grace V. Jean.

High-altitude airship-mounted laser relay mirrors. In addition to SBLRMs, LRMs can also be based terrestrially, on a fleet of high-altitude airships or other lighter-than-air heliostats, to provide always-on-call, high-altitude, in-theater, relay mirror platforms for local and faraway TBLs, and to serve as a relay to other LRMs, especially those in orbit, according to Edward Duff and Donald Washburn, in their article, "The Magic of Relay Mirrors," as part of the AFRL Directed Energy Directorate. (See Figure 4, above). While the 450 foot-long HAA itself, according to Erik Sofge's article in Popular Mechanics, "4 New 'Blimp' Designs Bring Return of the Airship," is not currently under development as originally proposed, its radar-ISR-mission-specific incarnation, the Integrated Sensor Is Structure (ISIS), is: the Defense Advanced Research Projects Agency has allotted $400 million to Lockheed Martin to develop and build an ISIS prototype. If an airship can carry enormous radar antenna (built into its structure), it can similarly be modified to carry a LRM system, to make it a HAALRM.

An HAA could operate at up to 60,000 feet, and maintain station in a geostationary position, or fly in an 'orbit', remaining within continuous line of sight of any MGBL for periods of weeks or months at a time, a concept that is being studied at the Air Force research laboratory. An HAALRM would be the optimal 'first relay stage' for the nearest MGBL, and if nearly overhead, would minimize the energy-sapping distance that the beam would have to traverse through the atmosphere. The MGBL's beam could then be relayed onto a nearby target, or along to the next line-of-sight, air- or space-based mirror systems, to reach any target worldwide. According to Jeff Kueter and Howard Kleinberg in their article, "The Cruise Missile Challenge: Designing a Defense Against Asymmetric Threats," an HAALRM fleet could thus provide redirection capabilities for Homeland defense against 'asymmetric' cruise and ballistic-missile-launches from ships off U.S. coastlines.

Other advantages of a HAALRM fleet include quick and affordable repairs and upgrades with new technologies as they evolve, again at vastly lower cost and cost than deploying new weapons or upgrades to on-orbit systems.

Importantly, HAALRMs would be safe from being shot down while operating over CONUS or other 'friendly' territories, where the U.S. or its allies have air dominance, or there are otherwise no enemy counter-air assets capable of attacking them. Nor would airships at 60,000 feet or higher be at risk from small-arms ground fire, and even if they are, are very tough to shoot down. Antiaircraft radars designed to find much 'faster-movers' such as jets or helicopters are unlikely to detect and track a low-cross-section 'aircraft' moving at 80mph or less, according to Brinton Turner's article from Foxnews.com, "U.S. Army Tests Blimps to Shoot Down Enemy Missiles." Finally, and importantly, like their orbiting cousins, HAALRMs would be able to defend themselves by diverting 'feeder' beams onto incoming missiles or aircraft, similarly drawing upon virtually 'unlimited ammunition' supplied from TBLs. (See Figure 4, above)

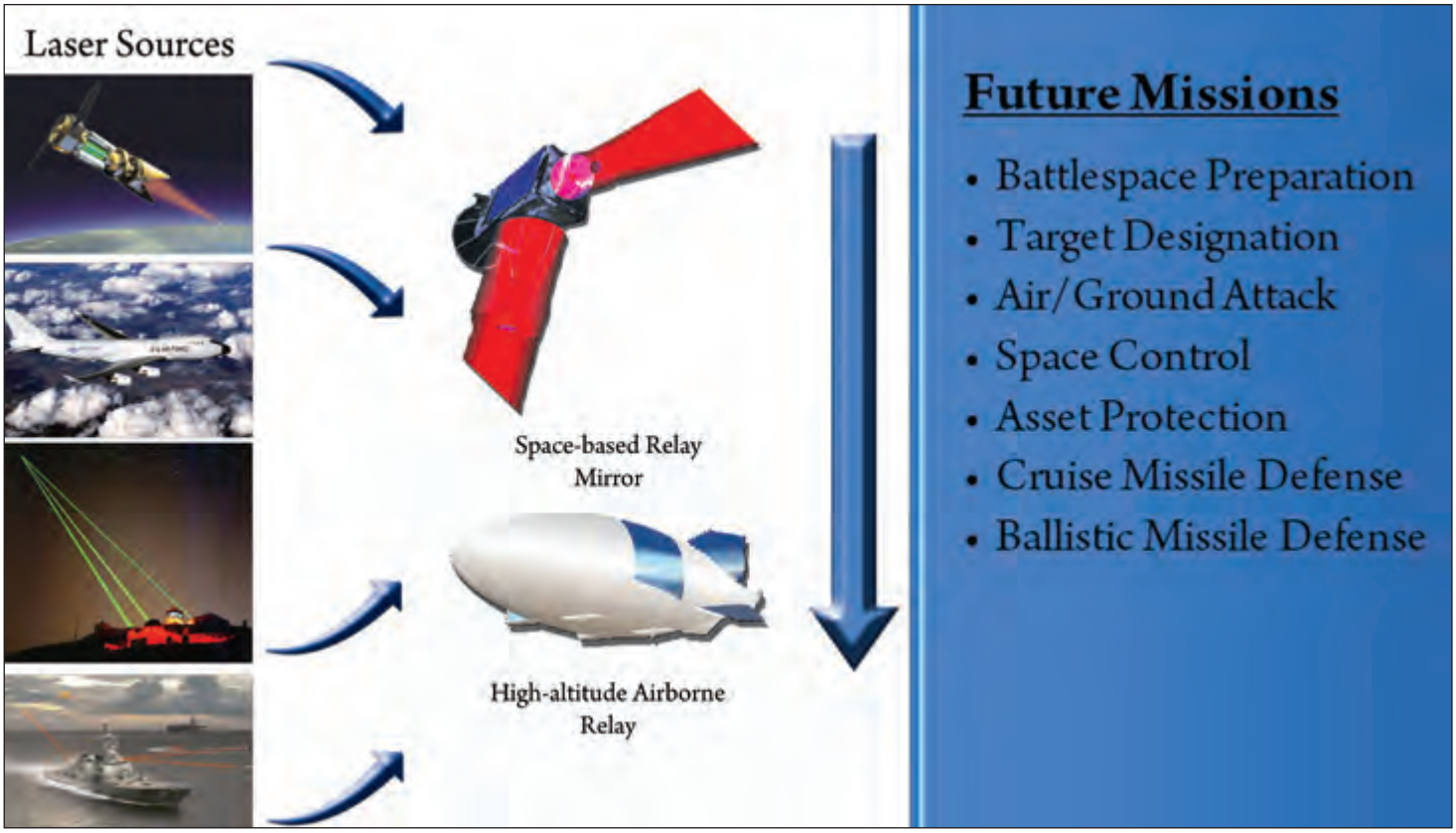

Figure 5: The Eagle Concept; High-altitude Airship System, air and space based laser relay mirrors. (Photo illustration by Jennifer McFadden, information provided by The Air Force Research Laboratory's Directed Energy Directorate)

SBI Type	Kill Technology	Weapon Location	Reusability	Viability
Orbiting Kinetic Kill Interceptor [1]	KE	LEO	No [1]	High
Space-Based Laser [2]	DE (light)	LEO	No [2]	Very low
Space-Based Laser Relay Mirror (SBLRM)	DE (light)	LEO	Yes	Very high
Ground-Based Laser (fixed-site)	DE (light)	Terrestrial	Yes	High
Mobile Ground-Based HEL (MGBL)	DE (light)	Terrestrial	Yes	Very high
Ship-Based HEL (NBL)	DE (light)	Terrestrial	Yes	Very high
Air-Based HEL (ALTB)	DE (light)	Terrestrial	Yes	Very high
High-Altitude-Airship Laser Relay Mirror (HAALRM)	DE (light)	Terrestrial	Yes	Very high

Table 1: Space-Based BMD Weapon Summary Table

The 'BMD Laser World-Wide Web.' Any terrestrially based high-energy laser, whether on land, at sea, or in the air, is by its very nature a tactical weapon; but give it some air- and space-based mirrors with which to reach around the curvature of the Earth, and it becomes a weapon of global significance, to defend against the greatest military threats on Earth.

A 'BMD-Laser World-Wide Web' can readily supplant any proposed constellation of SBLs to provide a far more affordable, powerful, effective, robust, and flexible BMD force, for many reasons. First, a small number of TBLs, combined with a fleet of HAALRMs, could provide CONUS-wide ballistic and cruise-missile defenses. Second, a larger array of TBL 'emitters' could either fire directly at line-of-sight targets, or feed an array of HAALRMs and SBLRMs to defend against virtually any ballistic missile around the world, especially in their Boost Phase. Third, the array could also be used to intercept ASATs before they can reach their satellite targets; after all, during the ascent phase, an ASAT is just another boosting ballistic missile; and even in its terminal phase, an ASAT is similarly just another midcourse warhead. Fourth, the array could itself be used for ASAT operations, to dazzle, blind, disable, or destroy enemy satellites, as part of a greater war effort against a fully space-capable adversary. Fifth, a large, widely-distributed system of emitters and reflectors is a much more difficult force to attack, degrade, or disable. Sixth, such a force could also engage a multitude of missile targets, both concurrently and in rapid order. Finally, TBLs could also be used for space-debris mitigation, particularly in cleanup operations in the aftermath of an intensive ASAT war, especially if adversaries used debris-generation tactics or blast-fragmentation

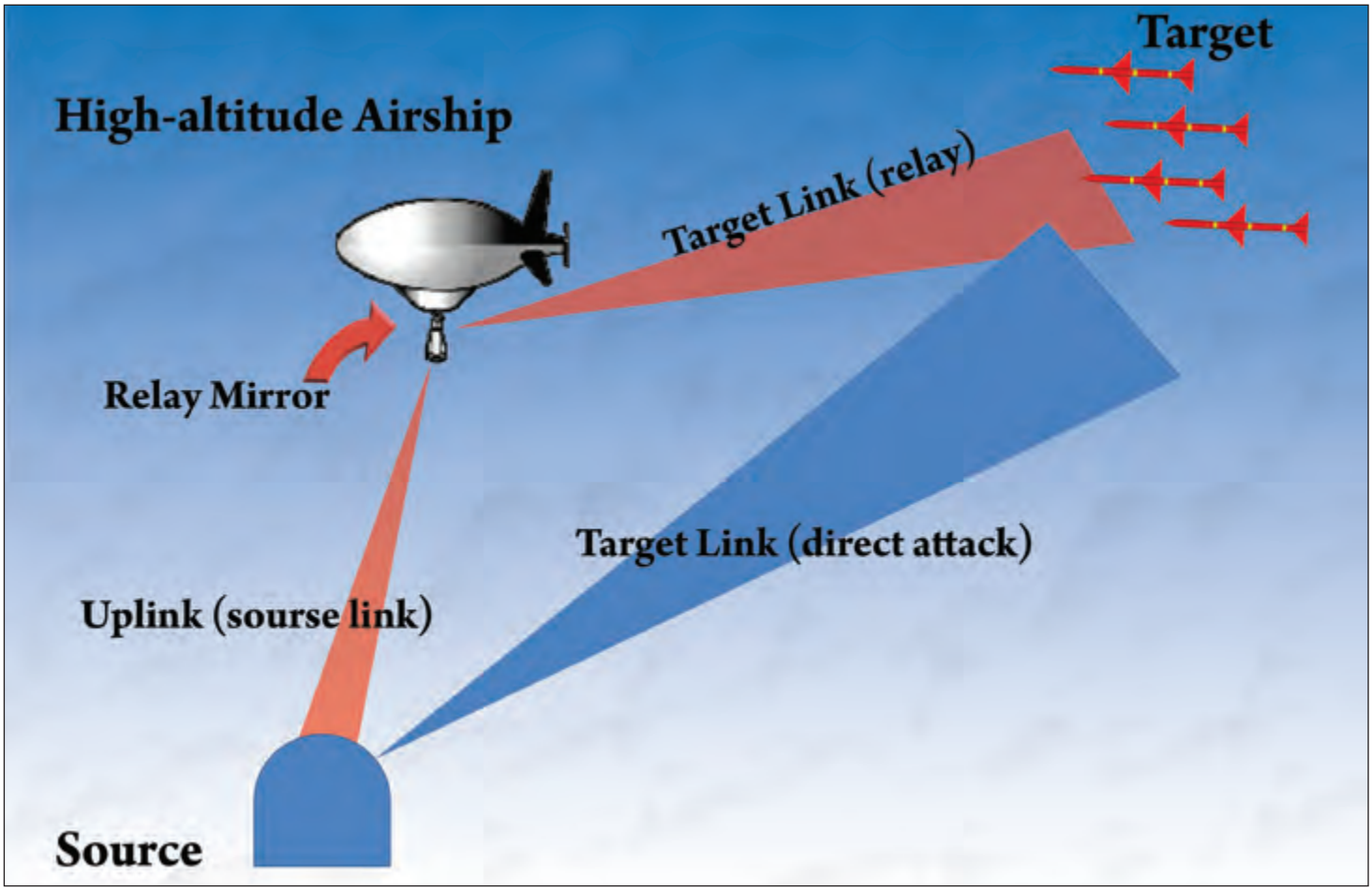

Figure 6: High-altitude Airship System, air and space based laser relay mirrors. (Photo illustration by Jennifer McFadden, information provided by The Air Force Research Laboratory's Directed Energy Directorate)

weapons, according to Ivan Bekey's 1997 article in Aerospace America, "Orion's Laser: Hunting Space Debris."

TBLs' effectiveness could be constricted by the availability of orbiting relay mirrors to achieve global reach, and could also suffer from line-of-sight-to-mirror and weather limitations, all restricting their global-range potential. Nevertheless, with a sufficient number of terrestrial sources arrayed throughout CONUS and worldwide, neither weather nor location would be a critical limitation to the availability of at least some emitters and relays at any time. (See Figure 5, 6 and Table 1)

Realizing the potential of HELs. As ballistic missiles and nuclear weapons proliferate into the hands of rogue and increasingly hostile states (and possibly non-state actors), and the world becomes a correspondingly more dangerous place, the need for missile defenses that can maximize the chances of intercepting ballistic missiles grows apace. Space is the optimal 'basing mode' for boost-phase missile defenses, which is the best phase to do so. Most importantly, space basing is the only way to provide affordable, achievable, global missile-defense coverage.

The foundations for space-based BMD were laid decades ago, during the Reagan administration's SDI program. Brilliant Pebbles was cancelled for political reasons, not for any real-world reasons of technical viability or affordability. Furthermore, SDI yielded a number of critical technologies that laid the foundation not only for today's missile defense systems, but also for the future. The decades since SDI are opening up new possibilities for technologies that can not only make space-based kinetic-energy BMD weapons possible, but most importantly, directed-energy-based ones, as well.

Space-based, ballistic missile defense weapons can take many forms, from kinetic-energy interceptors, to high-energy lasers, to mirrors that can literally bounce the beams from any source to any point around the world, instantaneously.

This paper argues that the SBL mission can best be accomplished, not by placing HELs in space, but only the mirrors, with the actual megawatt-class emitters based on mobile terrestrial platforms, on land, at sea, and in air, working as power-sources to floating or orbiting mirror arrays, to reach around the world. TBLs can provide both theater-level and global-level defense against ballistic missiles launched from anywhere in the world, at U.S. or friendly targets. The true potential of HELs can thus be realized, and their reach and effectiveness multiplied many times over, by using networks of airship- and space-based laser relay mirrors, high above the Earth.

It's time for America to shed its 'fear of heights' by deploying missile defense systems into space, the highest frontier, to make it our first, and best, stand against annihilation by nuclear-armed ballistic missiles.

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